

HS 637944

REPORT NUMBER: 201U-CAL-05-04

**SAFETY COMPLIANCE TESTING FOR FMVSS 201
OCCUPANT PROTECTION IN INTERIOR IMPACT
UPPER INTERIOR HEAD IMPACT PROTECTION**

**GENERAL MOTORS OF CANADA LTD.
2005 BUICK LACROSSE 4-DOOR SEDAN**

NHTSA NUMBER: C50104

CALSPAN TEST NUMBER: 8754-FMH-04

CALSPAN
TRANSPORTATION SCIENCES CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225



Test Date: March 24, 2005

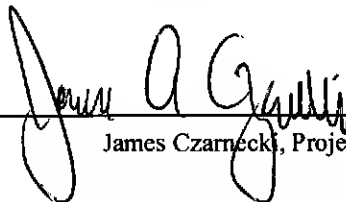
FINAL REPORT

PREPARED FOR:

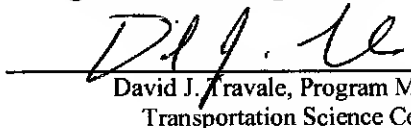
U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Safety Assurance
Office of Vehicle Safety Compliance
Mail Code: NVS-220, Room 6111
400 Seventh Street, SW
Washington, DC 20590

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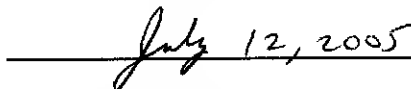
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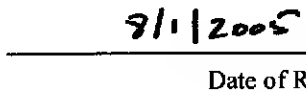

David J. Travale, Program Manager
Transportation Science Center

Approval Date:


July 12, 2005

FINAL REPORT ACCEPTANCE BY:


NHTSA, Office of Vehicle Safety Compliance


9/1/2005
Date of Report Acceptance

TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. 201U-CAL-05-04		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of FMVSS 201 Compliance Testing of a 2005 Buick LaCrosse 4-Door Sedan NHTSA No. C50104				5. Report Date March 24, 2005	
				6. Performing Organization Code CAL	
7. Author(s) David J. Travale, Program Manager James Czarniecki, Project Engineer				8. Performing Organization Report No. 8754-FMH-04	
9. Performing Organization Name and Address Calspan 4455 Genesee Street Buffalo, New York 14225				10. Work Unit No.	
				11. Contract or Grant No. DTNH22-04-C-01027	
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Vehicle Compliance Mail Code: NVS-220 400 Seventh, SW, Room 6111 Washington, D.C. 20590				13. Type of Report and Period Covered Final Report March 2005	
				14. Sponsoring Agency Code NVS-220	
15. Supplementary Notes					
16. Abstract Compliance tests were conducted on the subject vehicle a 2005 Buick LaCrosse 4-Door Sedan in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure TP-201U-01 for determination of FMVSS 201 compliance. Test failures identified were as follows in the table below:					
Target Point	Horizontal	Vertical	Velocity	HIC	HICd
URBP	270°	38°	23.6	1233.1	1096.7
-	-	-	-	-	-
17. Key Words Compliance Testing Safety Engineering FMVSS 201U			18. Distribution Statement Copies of this report are available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 400 Seventh St., SW Washington, DC 20590 Telephone No.: 202-366-4946		
19. Security Classif. (of this report) UNCLASSIFIED		20. Security Classif. (of this page) UNCLASSIFIED		21. No. of Pages	22. Price

Form DOT F1700.7 (8-69)

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SECTION 1

PURPOSE AND TEST PROCEDURE

This head impact compliance test is part of the FMVSS 201 Upper Interior Head Impact Protection Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-04-C-01027. The purpose of this head impact compliance test was to determine whether the subject vehicle, a 2005 Buick LaCrosse 4-Door Sedan, NHTSA No. C50104, meets the performance requirements of FMVSS 201, Occupant Protection in Interior Impact. The compliance test was conducted in accordance with the OVSC Laboratory Test Procedure No. TP-201U-01 dated April_03, 1998.

SECTION 2

SUMMARY OF UPPER INTERIOR HEAD IMPACTS

A 2005 Buick LaCrosse 4-Door Sedan , NHTSA No.C50104 , was impacted at various locations throughout its upper interior by a 4.54 kg 50th percentile headform. A total of twelve (12) impacts were performed in this test series. The target area impacts were chosen by the NHTSA Contracting Officers Technical Representative (COTR). A summary of test results can be found on data sheet 2-1. The twelve (12) area chosen for testing were:

OP2	SR3	RP1	BP3	BP1
AP3	AP1	BP2	URBP	AP2
FH1	SR2A			

The selected impact areas on the test vehicle appeared to comply with the performance requirements of FMVSS 201 with the exception of URBP impact area.

Five Free Motion Headforms (FMH), were used in this test series. All five FMH's were calibrated prior to and after the test series. Calibration information are included in Appendix B. Each FMH weighed 4.54 ± 0.5 kg and has an orthogonal tri-axis accelerometer pack mounted at the center of gravity (c.g.).

A total of three (3) channels of data for each target impact test are recorded on a Keyser-Threde data acquisition system. Data plots along with still photographs can be found in Section 3 of this report.

To document each target area impact test, one Weinberger high-speed video camera was placed at various locations to view the headform contact with the selected target area.

DATA SHEET 2-1

SUMMARY OF UPPER INTERIOR HEAD IMPACT TESTS

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

TARGET CODE	Target Coordinates						Approach Angles (degrees)		Velocity (kph)	FMH HIC	HIC(d)
	Driver Side			Passenger Side							
	X(mm)	Y(mm)	Z(mm)	X(mm)	Y(mm)	Z(mm)	Horizontal	Vertical			
AP1	2921.01	-542.24	1442.06	2928.36	541.83	1449.76	132°	27°	23.46	641.7	650.5
AP2	2793.98	-604.03	1354.06	2809.67	605.17	1360.67	210°	40°	23.72	800.1	770.1
AP3	2697.71	-630.83	1300.53	2701.84	631.25	1302.91	125°	38°	23.89	668.1	664.9
BP1	3462.58	-473.51	1533.64	3462.86	476.08	1536.86	90°	21°	23.72	711.2	703.0
BP2	3435.10	-611.58	1306.12	3439.31	615.05	1304.88	270°	14°	23.83	933.9	871.0
BP3	3389.06	-615.89	1348.15	3392.34	618.16	1349.19	90°	-4°	23.64	350.1	430.5
BP4	3486.71	-661.23	1254.32	3491.09	663.25	1255.77	-	-	-	-	-
FH1	2869.74	-449.53	1491.87	2871.52	442.96	1494.24	Relocated 1 circle		-	-	-
FH1_R1	2861.13	-430.09	1492.02	2860.74	429.31	1492.51	180°	50°	23.74	570.7	597.0
FH2	2859.00	-302.10	1504.10	2860.09	294.08	1506.59	-	-	-	-	-
OP1	4180.52	-462.93	1518.06	4181.09	462.28	1524.34	-	-	-	-	-
OP2	4246.18	-628.43	1349.94	4248.04	623.72	1354.80	90°	9°	23.54	801.5	771.1
RH1	4261.25	-363.85	1507.29	4260.01	363.97	1512.40	-	-	-	-	-
RP1	4239.37	-498.71	1485.26	4234.16	502.63	1487.27	Relocated 1 circle		-	-	-
RP1_R1	4229.51	-514.29	1468.39	4217.70	512.90	1473.61	84°	24°	23.66	775.5	751.5
RP2	4453.03	-625.31	1334.93	4455.61	622.30	1337.40	Relocated 8 circles		-	-	-
RP2_R8	4298.08	-550.10	1429.24	4326.86	557.55	1420.58	-	-	-	-	-
SR1	3070.98	-494.68	1501.09	3078.97	498.62	1512.92	Relocated 1 circle		-	-	-
SR1_R1	-	-	-	3061.28	502.76	1499.08	-	-	-	-	-
SR2A	3220.44	-487.04	1522.96	3229.85	497.22	1540.94	270°	33°	23.48	820.3	785.3
SR2A_R2	-	-	-	3230.45	512.42	1512.11	Relocated 2 circles		-	-	-
SR2B	3162.64	-488.27	1517.02	3162.58	499.83	1536.25	Relocated 1 circle		-	-	-

SR2B_R1	-	-	-	-	3147.93	482.43	1518.02	-	-	-	-	-
SR3	3925.80	-461.28	1522.10	1527.37	3926.65	461.77	1527.37	90°	35°	23.36	781	755.6
UR_AP	3089.87	-398.36	1528.07		3089.86	390.13	1531.31	-	-	-	-	-
UR_BP	3462.97	-382.54	1586.10		3462.25	383.26	1589.19	270°	38°	23.6	1233.1	1096.7
UR_RP	4099.99	-393.23	1550.05		4098.74	394.37	1553.87	-	-	-	-	-
UR_SR	3821.41	-385.98	1584.30		3243.65	380.58	1578.65	-	-	-	-	-

*HIC(d)=0.75446(Free Motion Headform HIC)+166.4

DATA SHEET 2-2

GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION:									
Year/Make/Model/Body Style:				2005 Buick LaCrosse 4-Door Sedan					
VIN:				2G4WC532451200267					
Month & Year of Manufacture:				10/04(SEE CERTIFICATION LABEL)					
Vehicle Body Color:				Red					
Engine Data:	6	Cylinders;	-	CID;	3.9	Liters;	-	cc	
Engine Placement:	x		Longitudinal;	or		-		Lateral	
Transmission:	4	Speed;	-	Manual;	x	Automatic;	-	Overdrive	
Final Drive:	-	Rear Wheel Drive;	x	Front Wheel Drive;	-	Four Wheel Drive			
Odometer Reading:	12		km						
Options:	x	A/C;	x	Power Steering;	x	Pwr.Brakes;	x	Pwr. Windows	
Interior Trim Information :									
1. Adjustable seat belt anchorages located vehicle B-Pillars.									
2. Front passenger side rail grab handle.									
3. Rear outboard occupant grab handles located on side rails.									

DATA FROM TIRE PLACARD:									
Tire Pressure (at capacity);				210		kPa FRONT			
				210		kPa REAR			
Recommended Tire Size:				P225/60R16					
Tires on Test Vehicle:		P225/60R16		Manufacturer:			Goodyear		
Vehicle Capacity Data:									
Number of Occupants:	2	Front;	3	Rear;	-	3rd Seat;	5	Total	
Type of Front Seats:	x	Bucket;	-		Bench;	-		Split Bench	
Type of Front Seat Back:	-	Fixed;	x	Adjustable with	x	Lever or	-	Knob	
Vehicle Capacity Weight (VCW)=				416		kg (A)			
No. of Occupants x 68 kg. =				340		kg (B)			
Rated Cargo/Luggage Weight (RCLW) =				76		kg (A-B) Max. RCLW = 136 kg.			

DATA SHEET 2-2

GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:					
Left Front	=	489	kg	Left Rear	= 293 kg
Right Front	=	508	kg	Right Rear	= 296 kg
TOTAL FRONT	=	997	kg	TOTAL REAR	= 589 kg
% of Total Weight	=	62.9	%	% of Total Weight	= 37.1 %
TOTAL WEIGHT	=	1586	kg		

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:		
Total Test Vehicle Delivered Weight=	1586	kg (A)
+ Rated Cargo/Luggage Weight =	76	kg (B)
TEST VEHICLE TARGET WEIGHT =	1662	kg (A+B)

WEIGHT OF TEST VEHICLE (FULLY LOADED):					
Left Front	=	484	kg	Left Rear	= 331 kg
Right Front	=	505	kg	Right Rear	= 333 kg
TOTAL FRONT	=	989	kg	TOTAL REAR	= 664 kg
% of Total Weight	=	59.8	%	% of Total Weight	= 40.2 %
TOTAL TEST WEIGHT	=	1653			
Weight of vehicle secured in test vehicles cargo area	=	65	kg		

TEST VEHICLE ATTITUDE (all dimensions in millimeters):				
AS DELIVERED:	Left Front	757	Left Rear	755
	Right Front	754	Right Rear	751
FULLY LOADED:	Left Front	756	Left Rear	735
	Right Front	752	Right Rear	730
Test Vehicle Wheelbase:	2800	millimeters		

TEST VEHICLE PITCH AND ROLL ANGLES:				
AS DELIVERED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	↑0.2	Front Bumper	↑0.1
	Right Door Sill	↓0.3	Rear Bumper	0.0
FULLY LOADED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	↓0.2	Front Bumper	↑0.2
	Right Door Sill	0.0	Rear Bumper	↓0.3
AS TESTED:	PITCH ANGLES		ROLL ANGLES	
	Left Door Sill	0.0	Front Bumper	↑0.1
	Right Door Sill	↓0.3	Rear Bumper	↓0.1

DATA SHEET 2-3

APPROACH ANGLE LIMITS

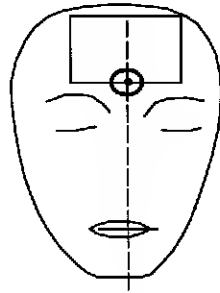
Target Code	Left Side		Right Side		Target Code	Vertical Angles (deg.)		Horizontal Angles (deg.)		Vertical Angles (deg.)	
	Minimum	Maximum	Minimum	Maximum		Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
AP1	203	255	-5	27	AP1	-5	27	105	157	-5	27
AP2	203	255	-5	40	AP2	-5	40	105	157	-5	40
AP3	203	255	-5	38	AP3	-5	38	105	157	-5	38
BP1	204	283	-10	21	BP1	-10	21	77	156	-10	21
BP2	ANY	ANY	0	14	BP2	0	14	ANY	ANY	0	14
BP3	204	283	-10	-4	BP3	-10	-4	77	156	-10	-4
BP4	204	283	-10	-7	BP4	-10	-7	77	156	-10	-7
OP1	270	270	-10	19	OP1	-10	19	90	90	-10	19
OP2	270	270	-10	9	OP2	-10	9	90	90	-10	9
RP1	270	345	-10	24	RP1	-10	24	15	90	-10	24
RP2	270	345	-10	27	RP2	-10	27	15	90	-10	27
FH1	180	180	0	50	FH1	0	50	180	180	0	50
FH2	180	180	0	50	FH2	0	50	180	180	0	50
RH	360	360	0	50	RH	0	50	0	0	0	50
SR1	270	270	0	36	SR1	0	36	90	90	0	36
SR2A	270	270	0	33	SR2A	0	33	90	90	0	31
SR2B	270	270	0	42	SR2B	0	42	90	90	0	42
SR3	270	270	0	35	SR3	0	35	90	90	0	35
URAP	ANY	ANY	0	50	URAP	0	50	ANY	ANY	0	50
URBP	ANY	ANY	0	38	URBP	0	38	ANY	ANY	0	38
URRP	ANY	ANY	0	50	URRP	0	50	ANY	ANY	0	50

Note: BP2 target location – Seat belt anchorage

DATA SHEET 2-4

SUMMARY TARGET IMPACT LOCATION ON FMH

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red



↖ RIGHT SIDE OF FACE

TARGET	Distance Above Point O (mm)	Distance Over From Pt. O (mm)
OP2	21	2 LEFT
SR3	14	6 LEFT
RP1	10	15 LEFT
BP3	10	45 RIGHT
BP1	8	5 RIGHT
AP3	20	6 RIGHT
AP1	28	35 RIGHT
BP2	12	17 LEFT
URBP	58	15 LEFT
AP2	35	24 RIGHT
FH1	24	14 RIGHT
SR2A	15	5 LEFT

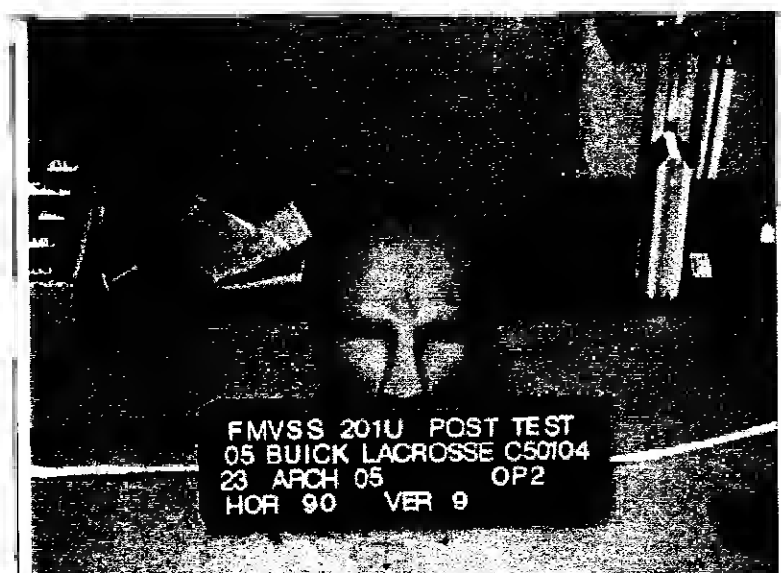
SECTION 3

SUMMARY OF TEST RESULTS AND DATA PLOTS

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	01
Test Date:	03/23/05
Target Location:	Other Pillar
Target Code:	OP2
Horizontal Impact Angle:	90°
Vertical Impact Angle:	9°
Ambient Temperature:	24.2C°
Relative Humidity:	13.9
Time of Impact:	9:20
Headform Number:	62

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	2	<input type="checkbox"/>	mm right	<input checked="" type="checkbox"/> mm left
On Centerline	21		mm up	



POST-IMPACT OP2 HEADFORM

Free Motion HIC	801.5
HIC(d)	771.1
Impact Velocity (kph)	23.54
HIC T1 (msec)	4.3
HIC T2 (msec)	10.6

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan C50104 - OP2

FMH Headform 0062

Location: OP2

Test Date: March 23, 2005

Work File: OP2

-----TEST RESULTS-----

Lab Temperature: 24.2 C

HICd: 771.1

Lab Humidity: 13.9 %

HIC (36ms): 801.5

Velocity at Impact: 23.54 KPH

t1: 4.3 msec

t2: 10.6 msec

Free Flight Distance: 207.73 mm

Duration: 6.3 msec

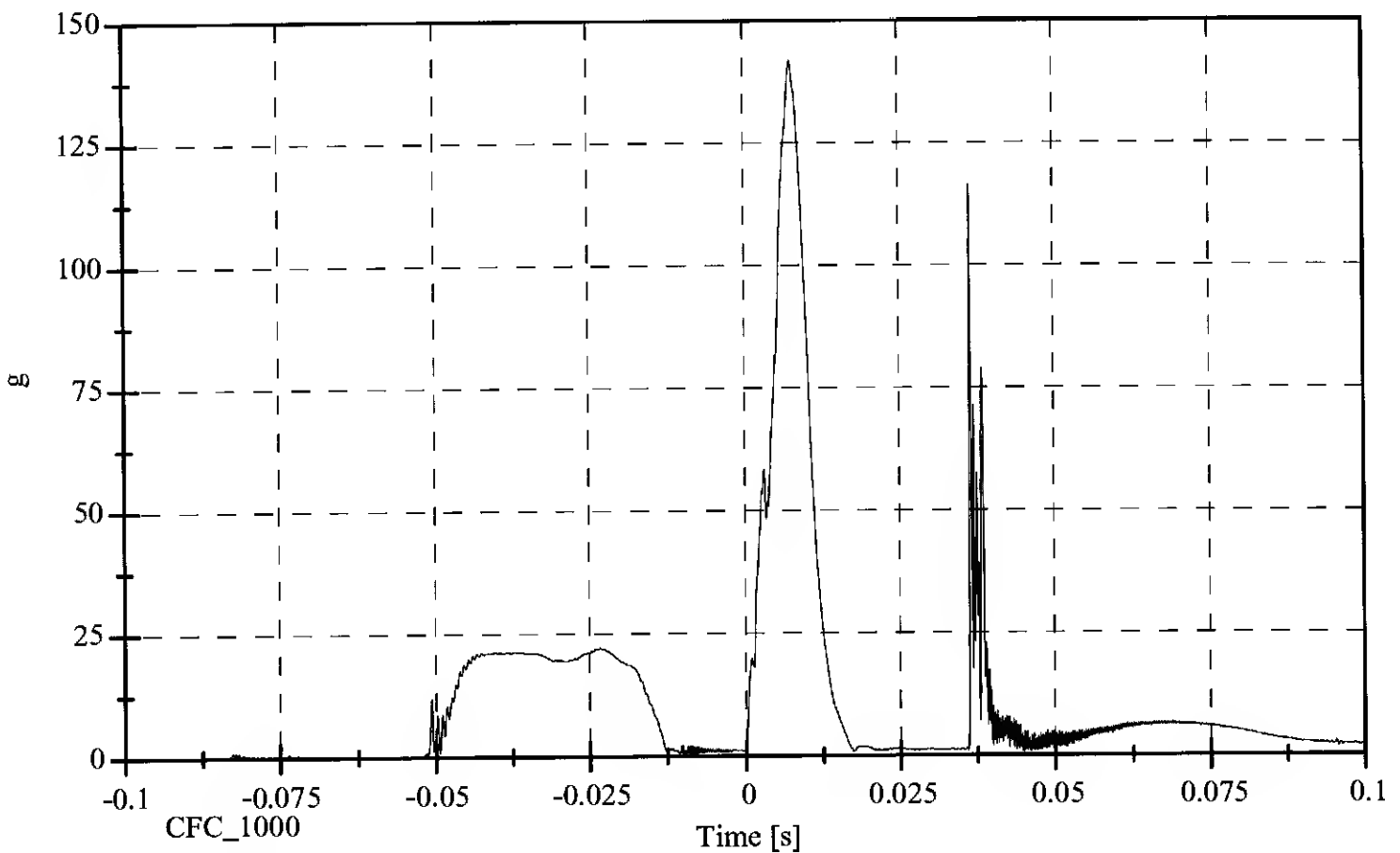
Maximum: 141.9 g

Average Acceleration: 10.5 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan
Headform Resultant

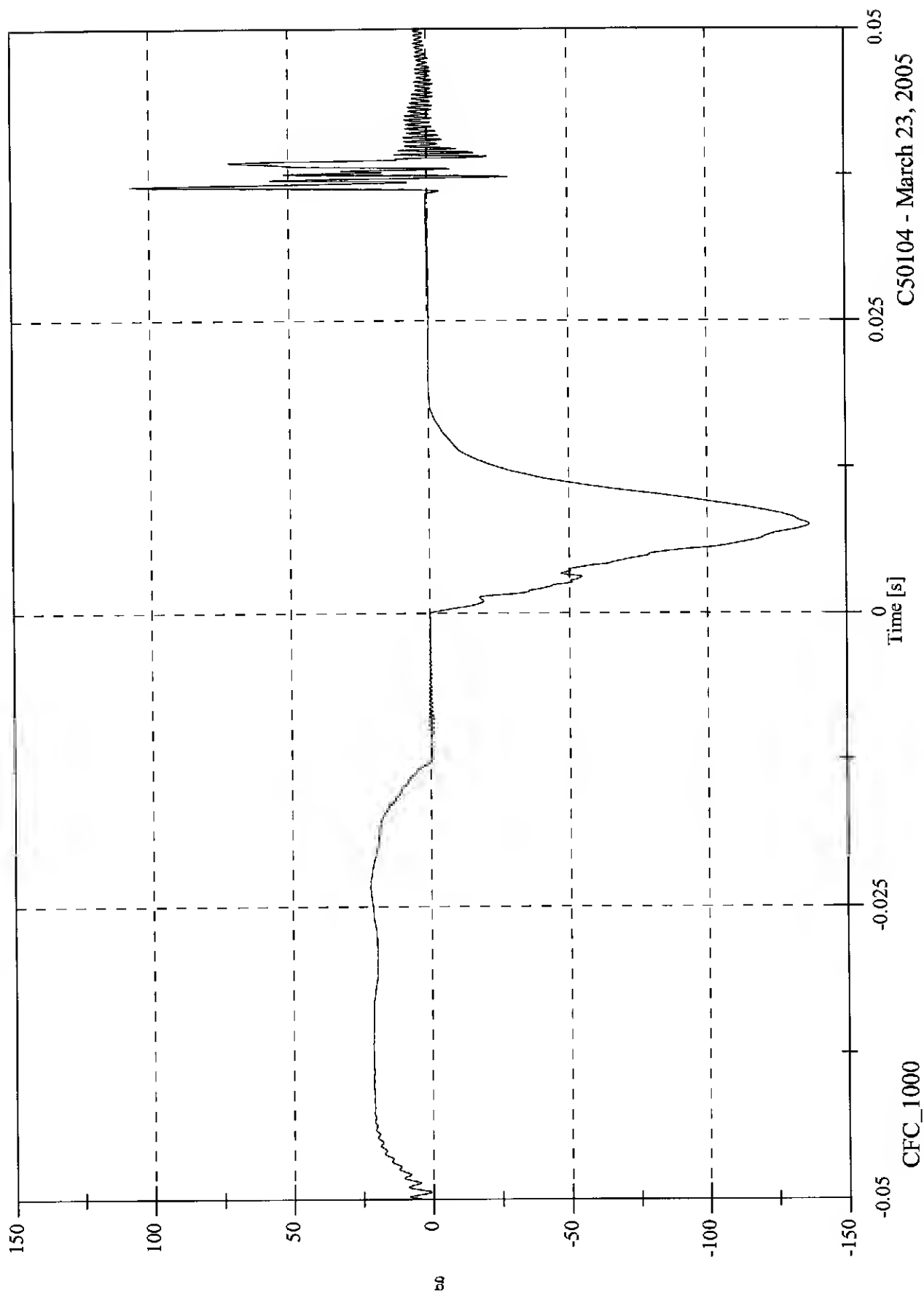
Max: 141.9 [g] at 0.008 [s]

Min: 0.0 [g] at -0.055 [s]



FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan
Headform X Acceleration

Max: 106.8 [g] at 0.037 [s]
Min: -136.7 [g] at 0.008 [s]



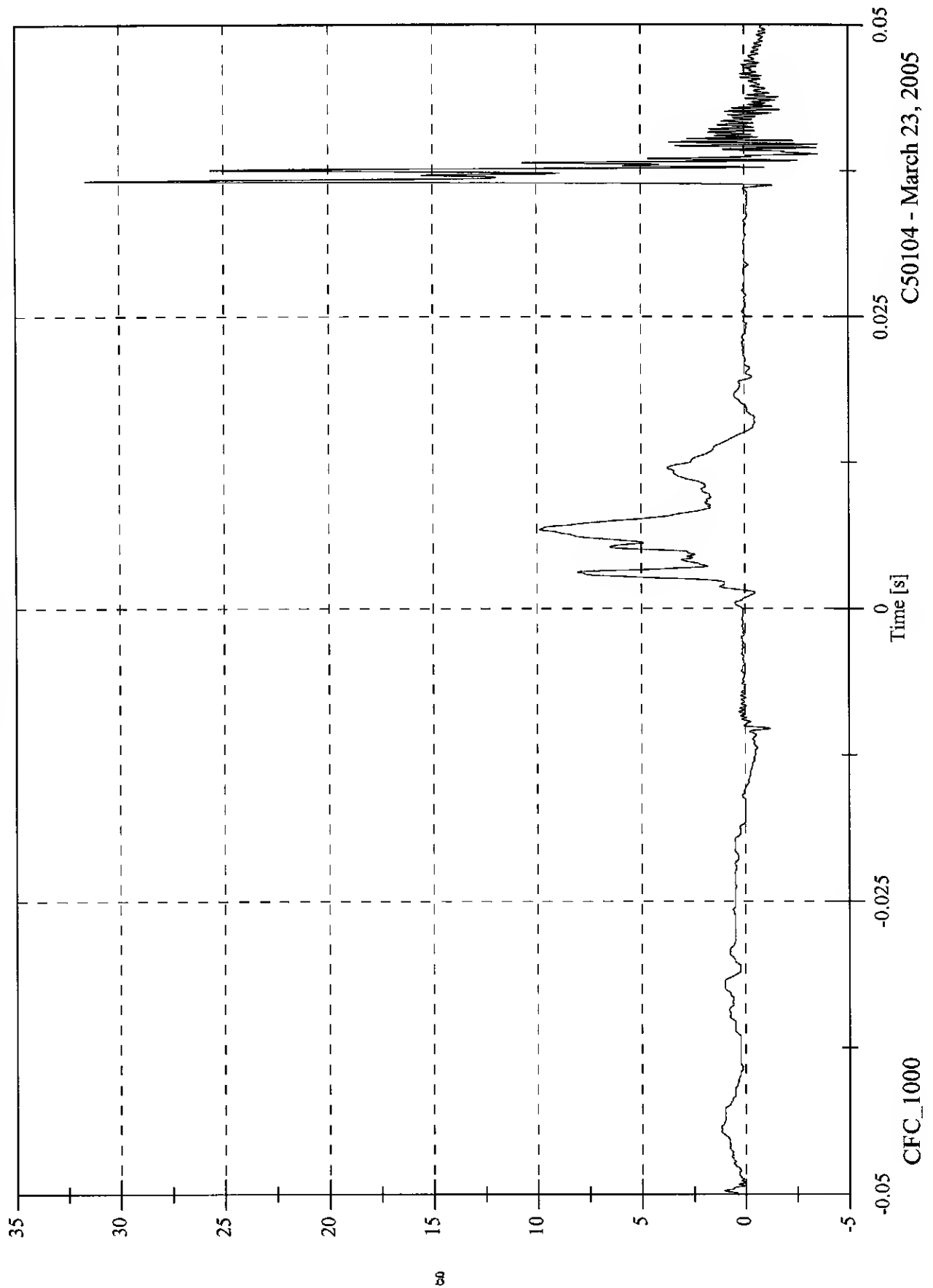
C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan

Headform Y Acceleration

Max: 31.6 [g] at 0.037 [s]

Min: -3.5 [g] at 0.039 [s]



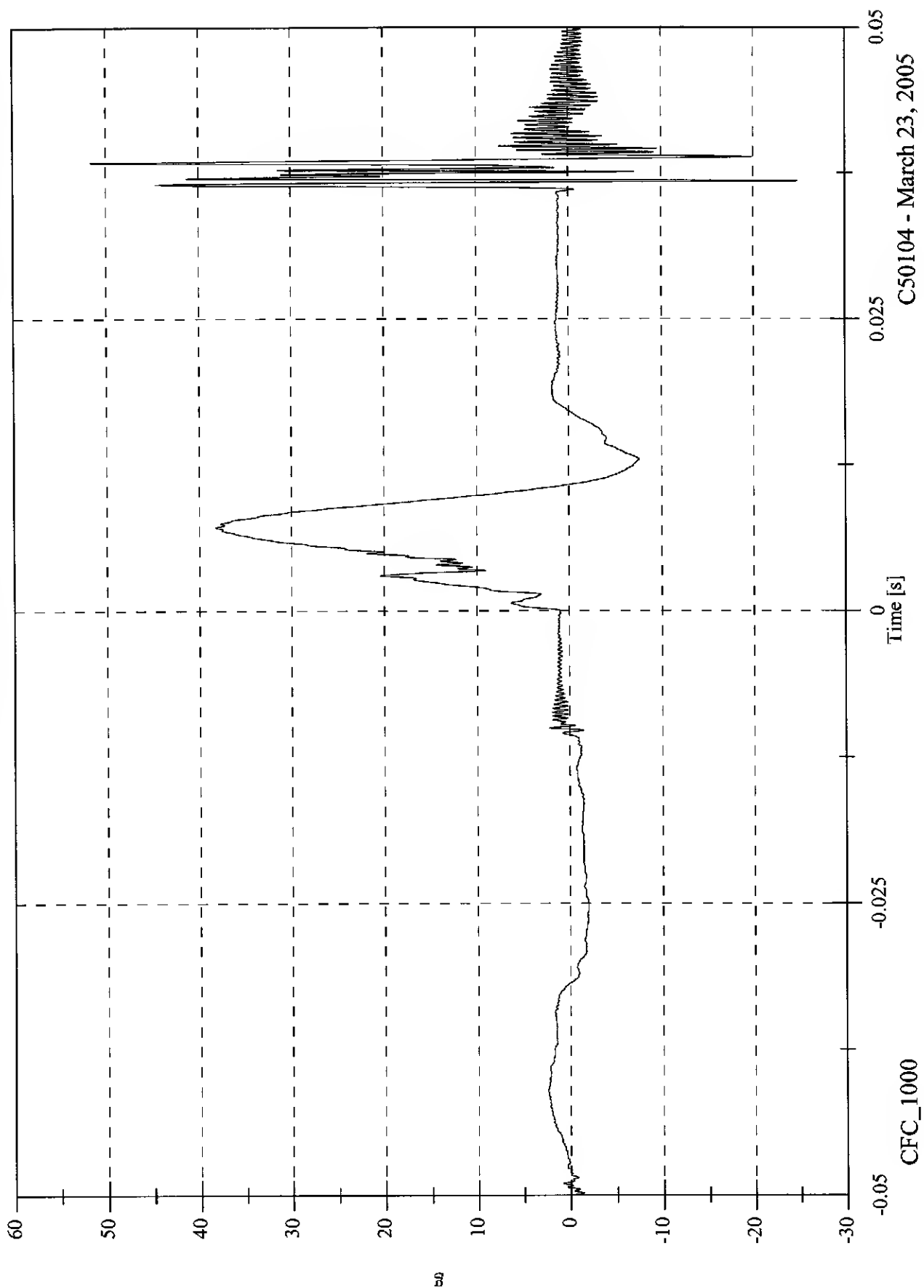
C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan

Headform Z Acceleration

Max: 51.6 [g] at 0.038 [s]

Min: -24.8 [g] at 0.037 [s]

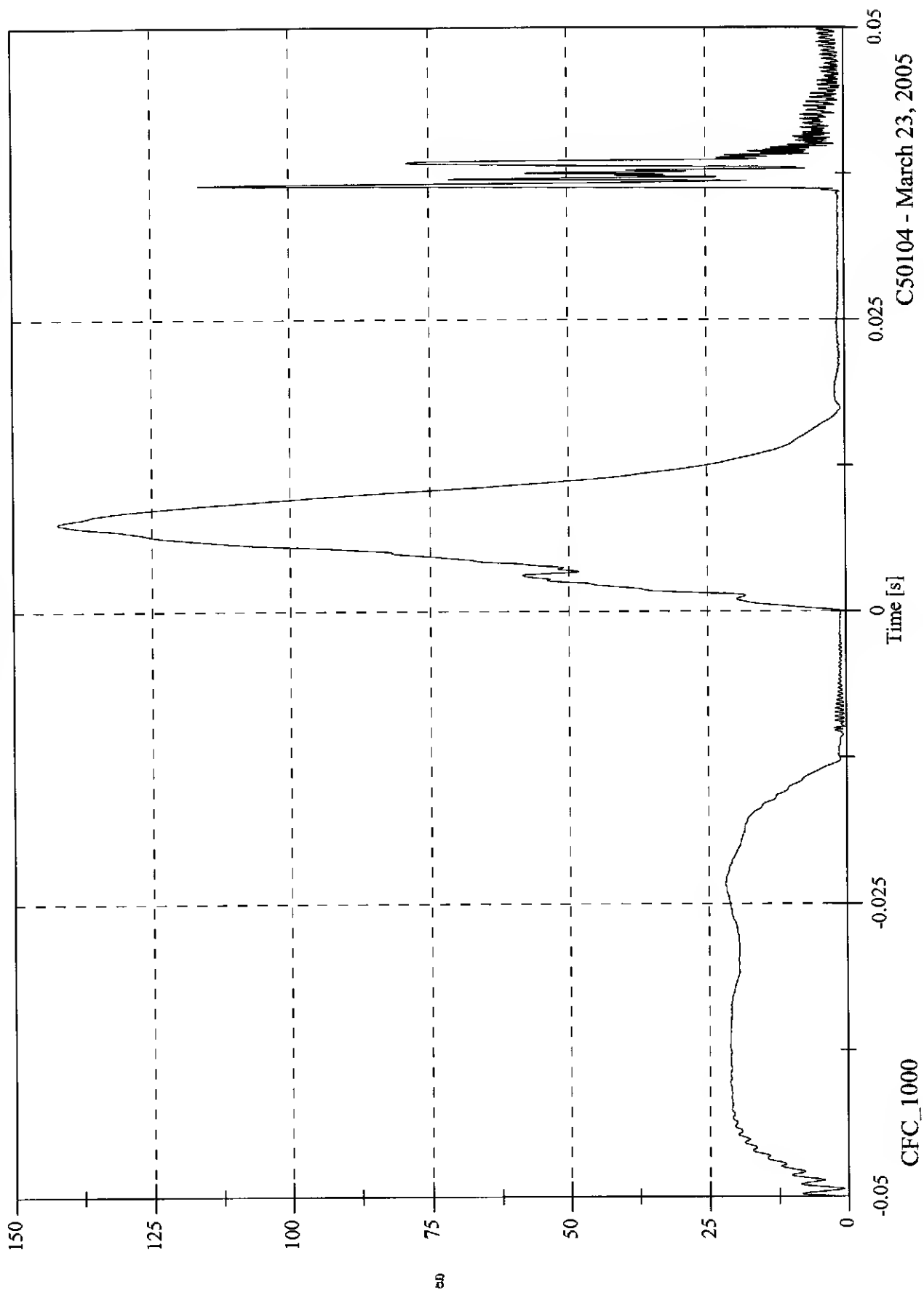


FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan

Headform Resultant

Max: 141.9 [g] at 0.008 [s]

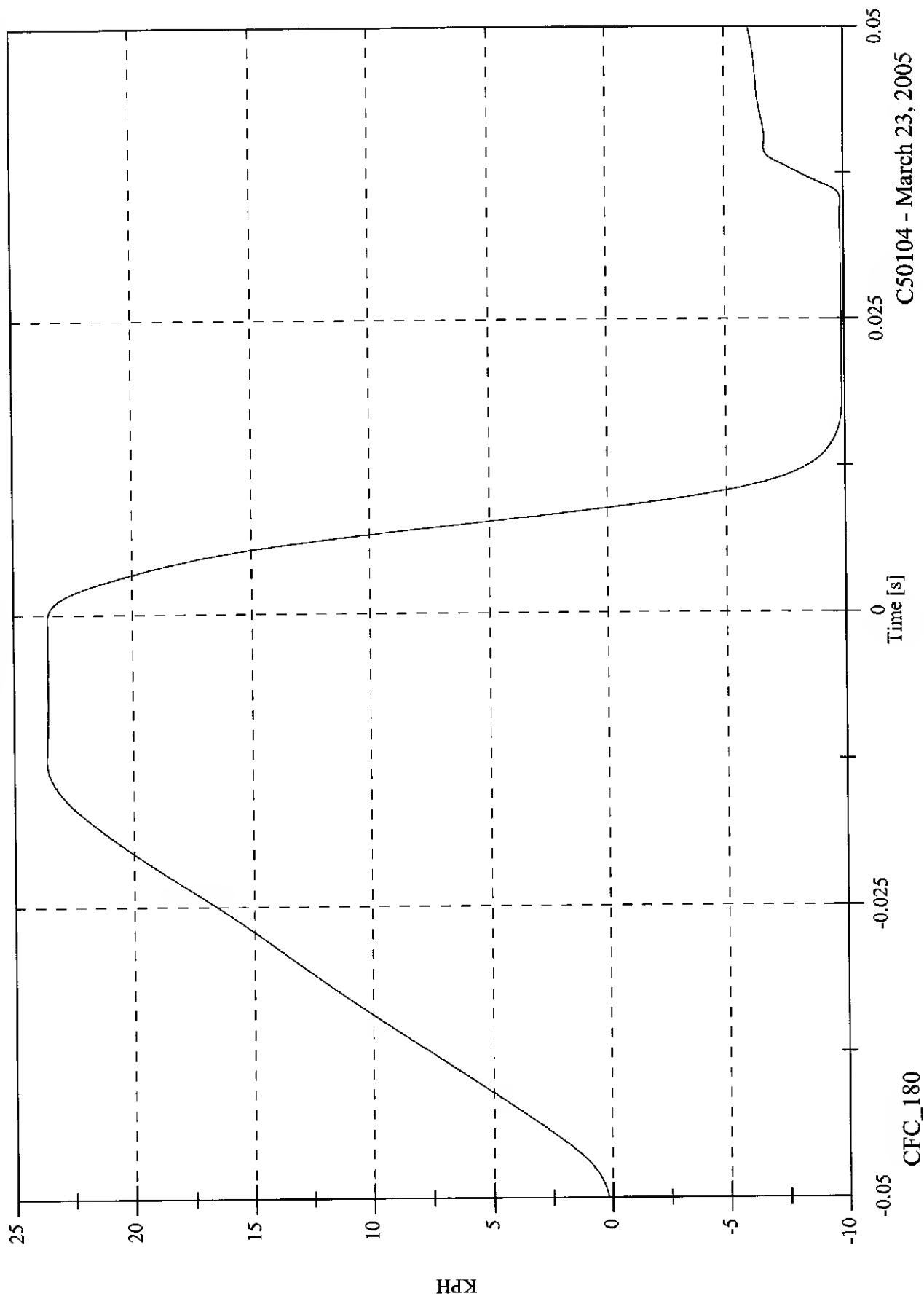
Min: 0.3 [g] at -0.010 [s]



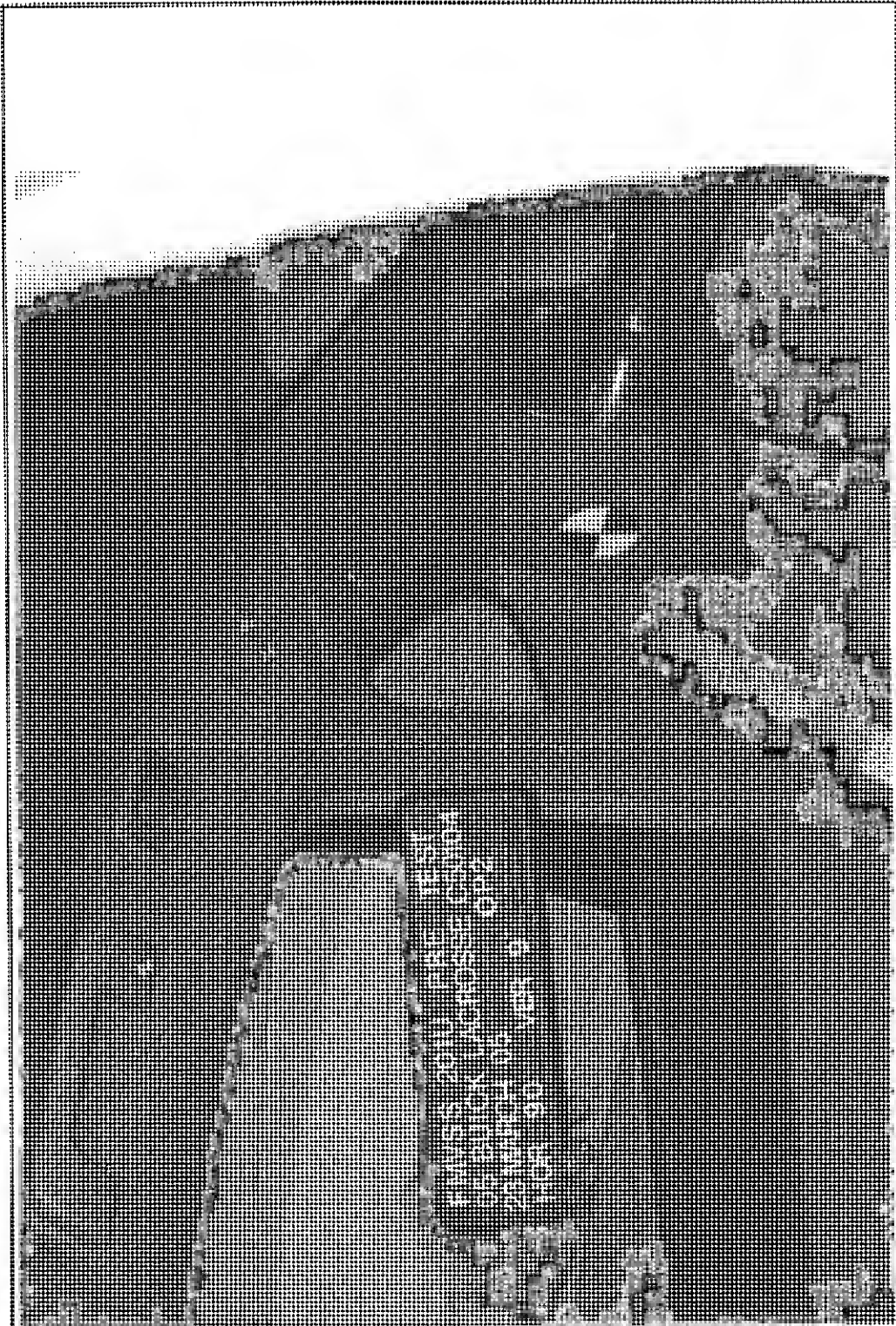
FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan
Headform Velocity

Max: 23.6 [KPH] at -0.012 [s]

Min: -9.9 [KPH] at 0.019 [s]

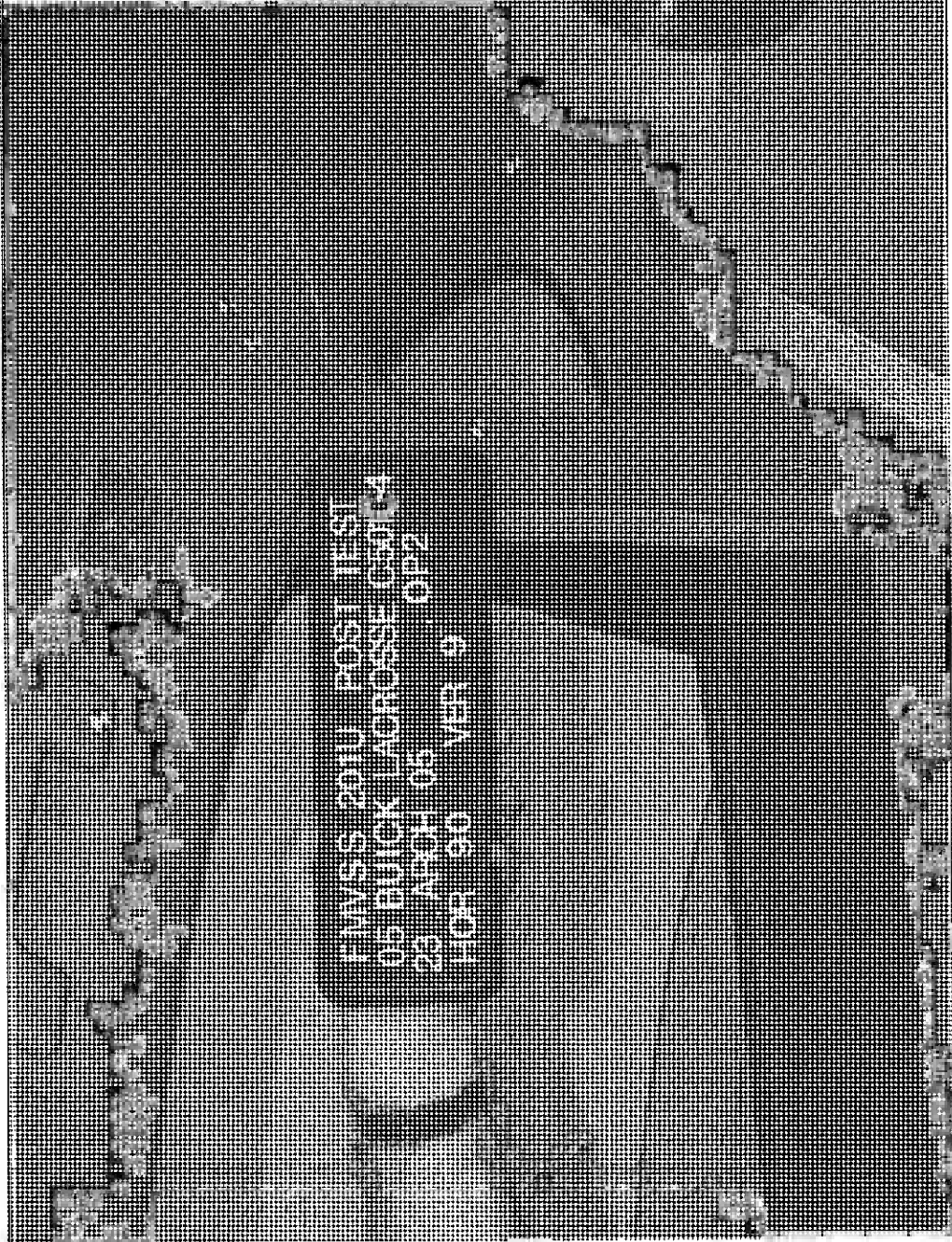


C50104 - March 23, 2005



PRE-IMPACT OP2

8754-FMH-05



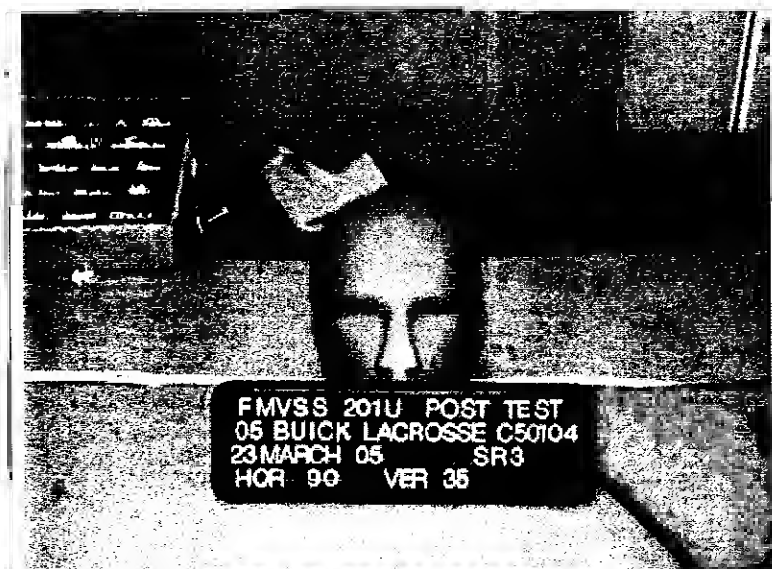
POST-IMPACT 0P2

8754-FMEI-04

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	02
Test Date:	03/23/05
Target Location:	Side Rail
Target Code:	SR3
Horizontal Impact Angle:	90°
Vertical Impact Angle:	35°
Ambient Temperature:	24.3C°
Relative Humidity:	13.9
Time of Impact:	9:50
Headform Number:	355

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	6	<input type="checkbox"/> mm right	<input checked="" type="checkbox"/> mm left
On Centerline	14	mm up	



POST-IMPACT SR3 HEADFORM

Free Motion HIC	781
HIC(d)	755.6
Impact Velocity (kph)	23.36
HIC T1 (msec)	2.9
HIC T2 (msec)	8.8

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - SR3

FMH Headform 355

Location: SR3

Test Date: March 23, 2005

Work File: SR3

-----TEST RESULTS-----

Lab Temperature: 24.3 C

HICd: 755.6

Lab Humidity: 13.9 %

HIC (36ms): 781.0

Velocity at Impact: 23.36 KPH

t1: 2.9 msec

t2: 8.8 msec

Free Flight Distance: 219.36 mm

Duration: 6.0 msec

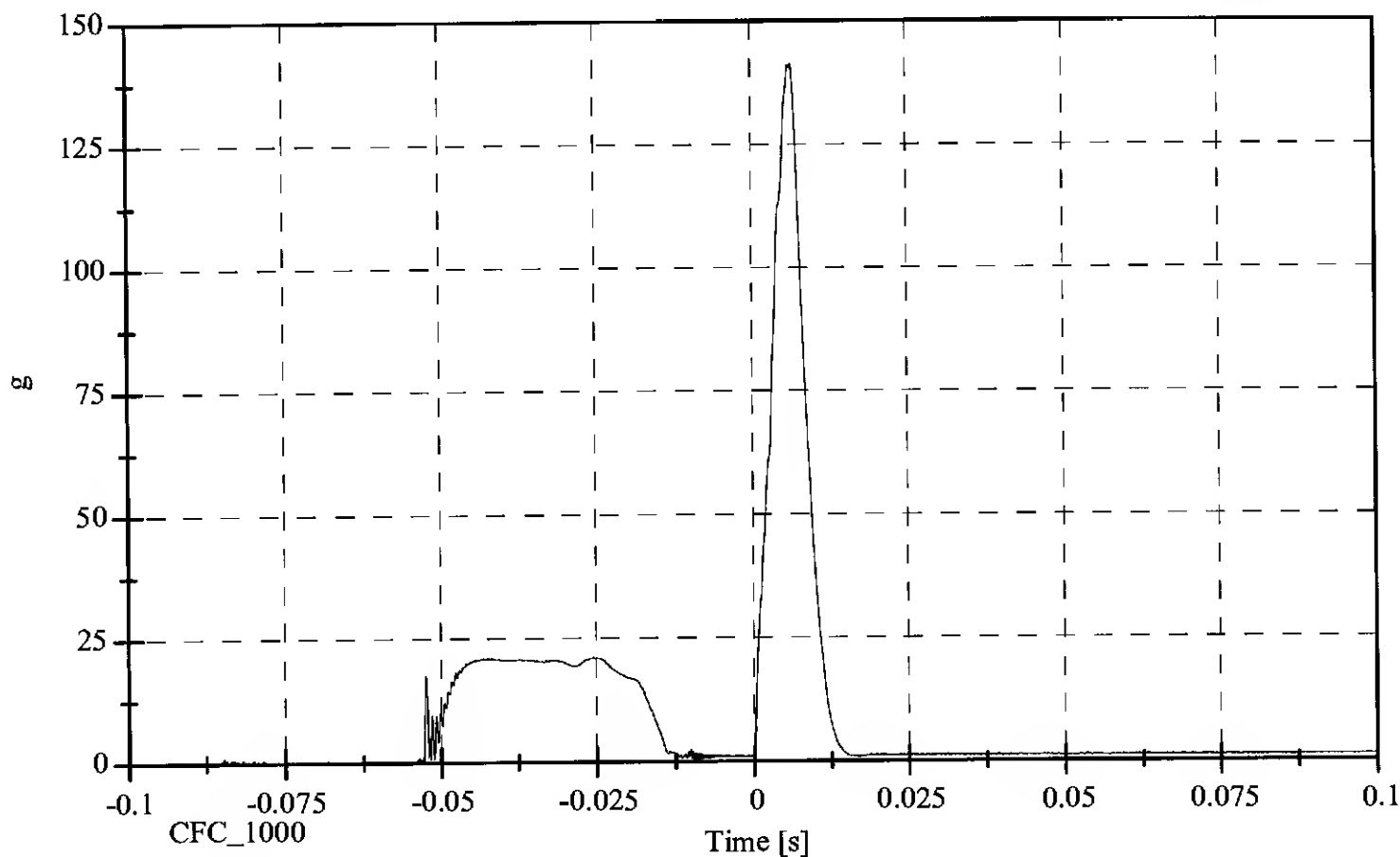
Maximum: 141.4 g

Average Acceleration: 8.5 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Resultant

Max: 141.4 [g] at 0.006 [s]

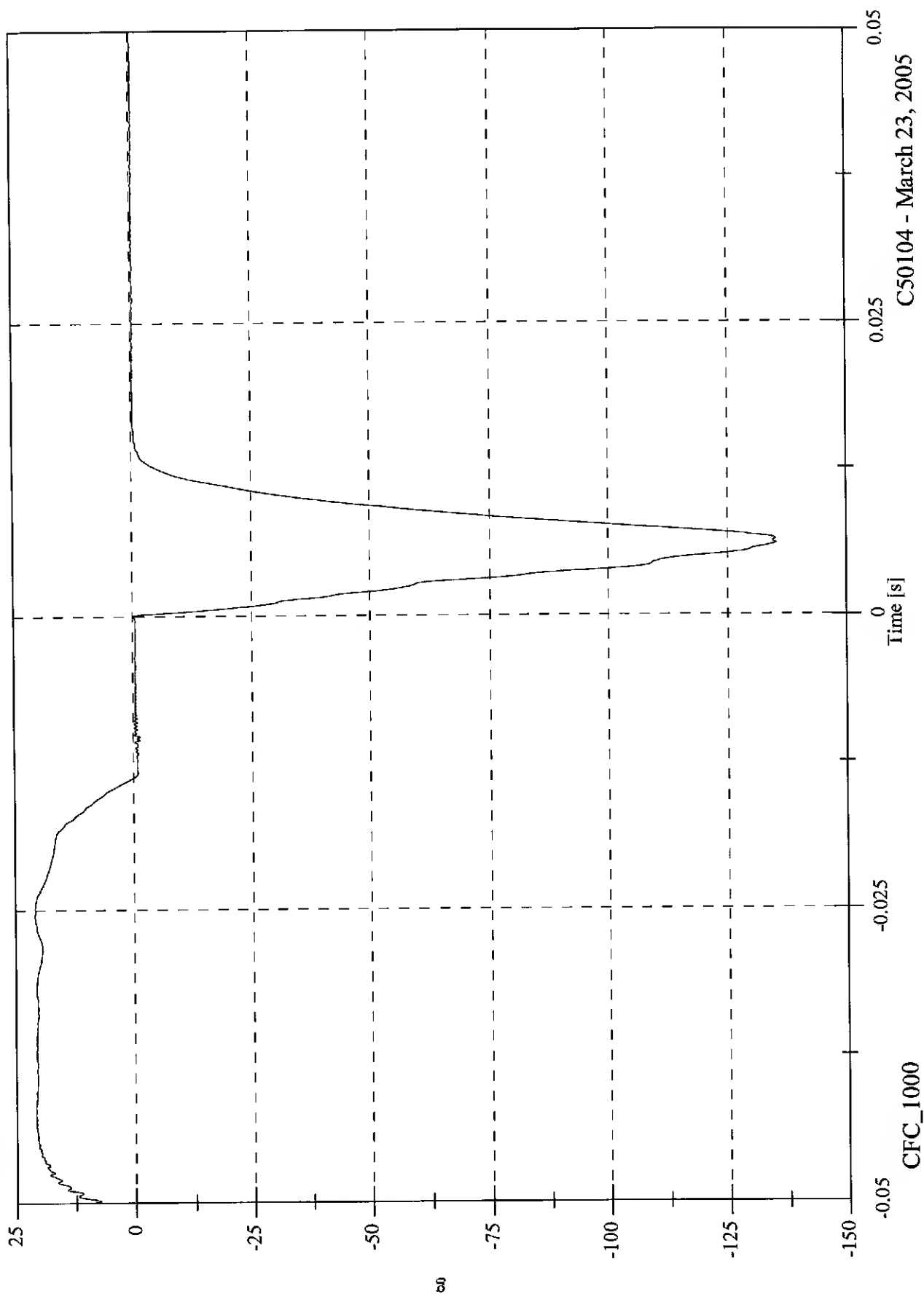
Min: 0.0 [g] at -0.097 [s]



Max: 21.0 [g] at -0.026 [s]
Min: -135.2 [g] at 0.006 [s]

Headform X Acceleration

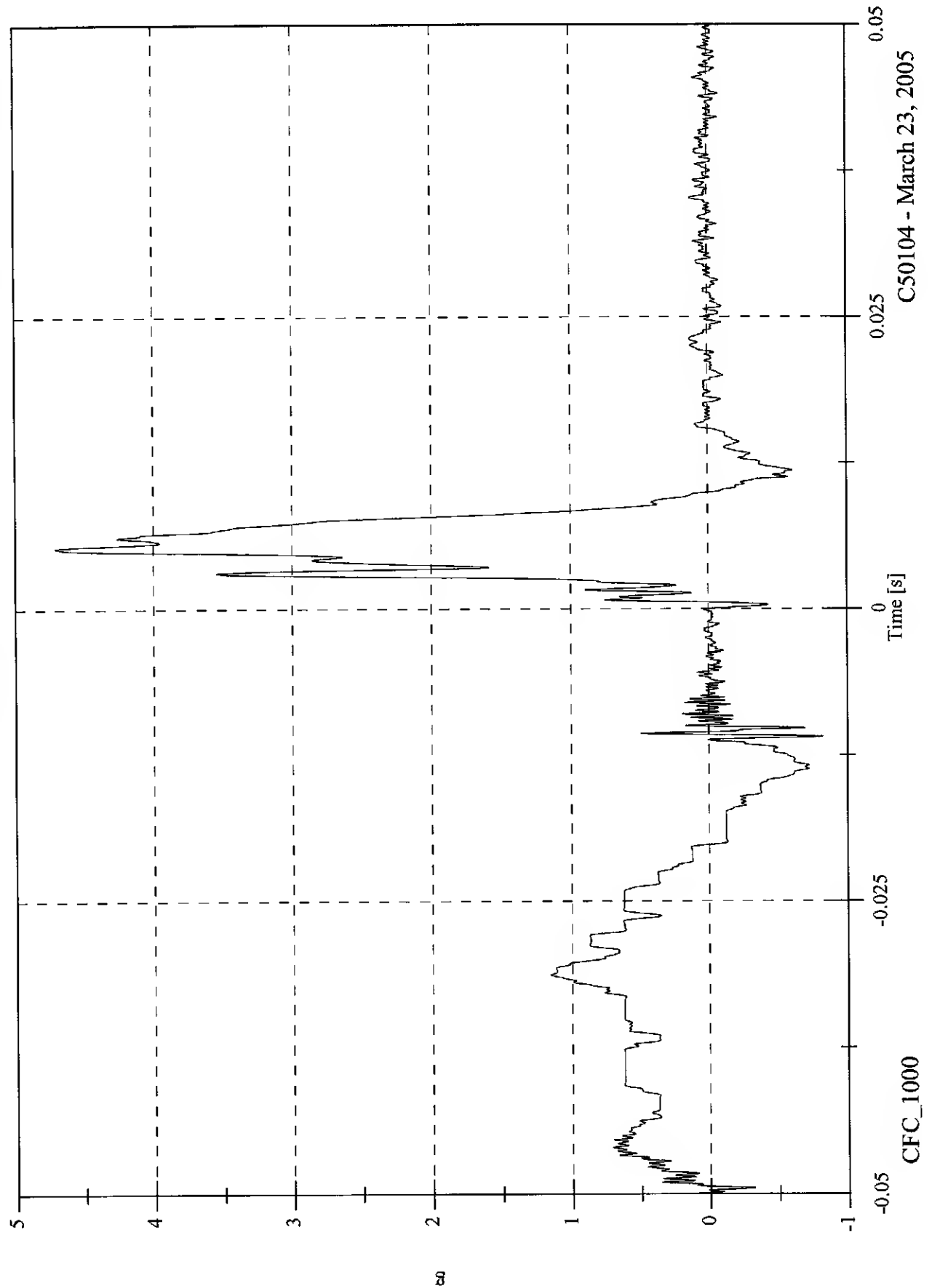
FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse



C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Y Acceleration

Max: 4.7 [g] at 0.005 [s]
Min: -0.8 [g] at -0.011 [s]

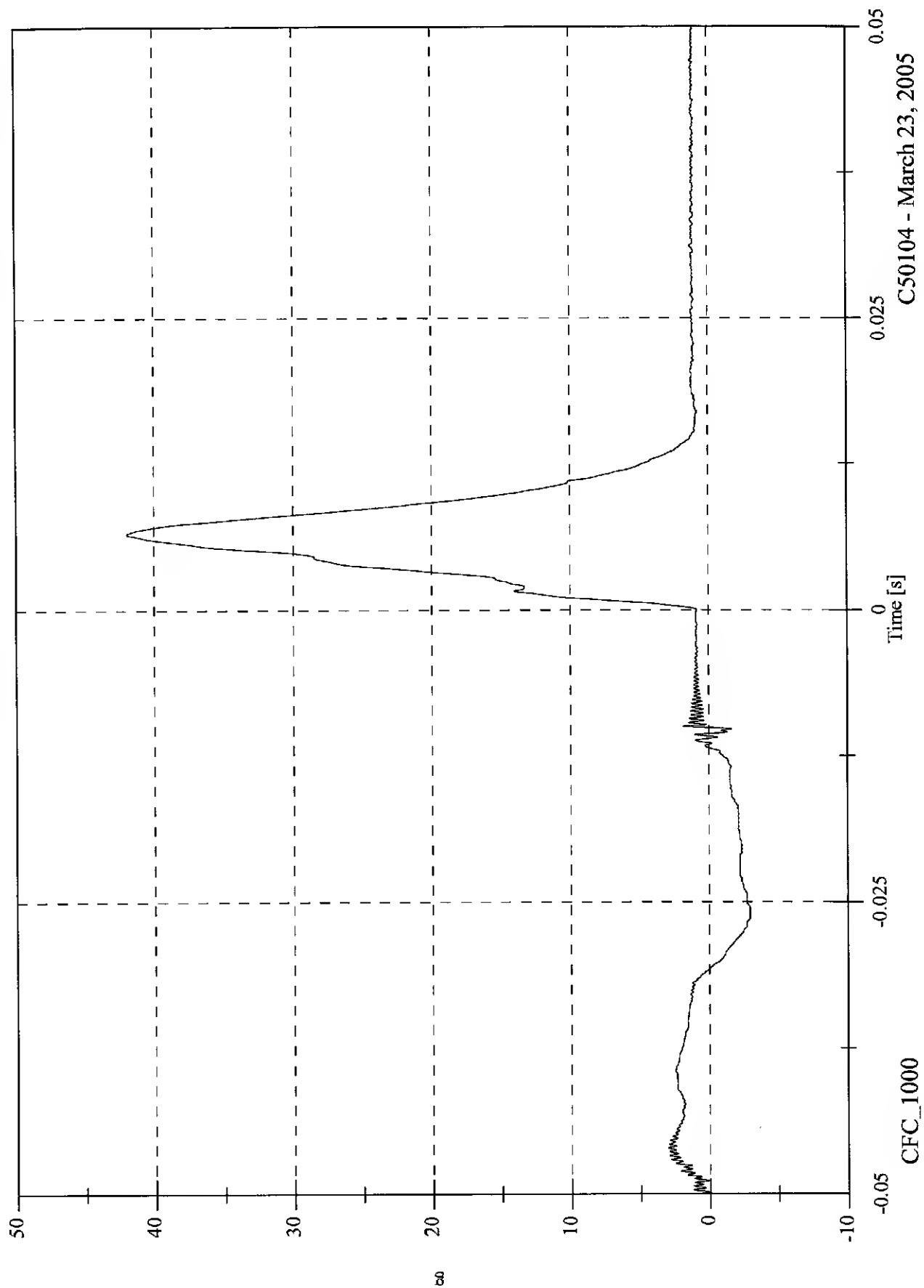


C50104 - March 23, 2005

Max: 42.0 [g] at 0.007 [s]
Min: -3.0 [g] at -0.026 [s]

Headform Z Acceleration

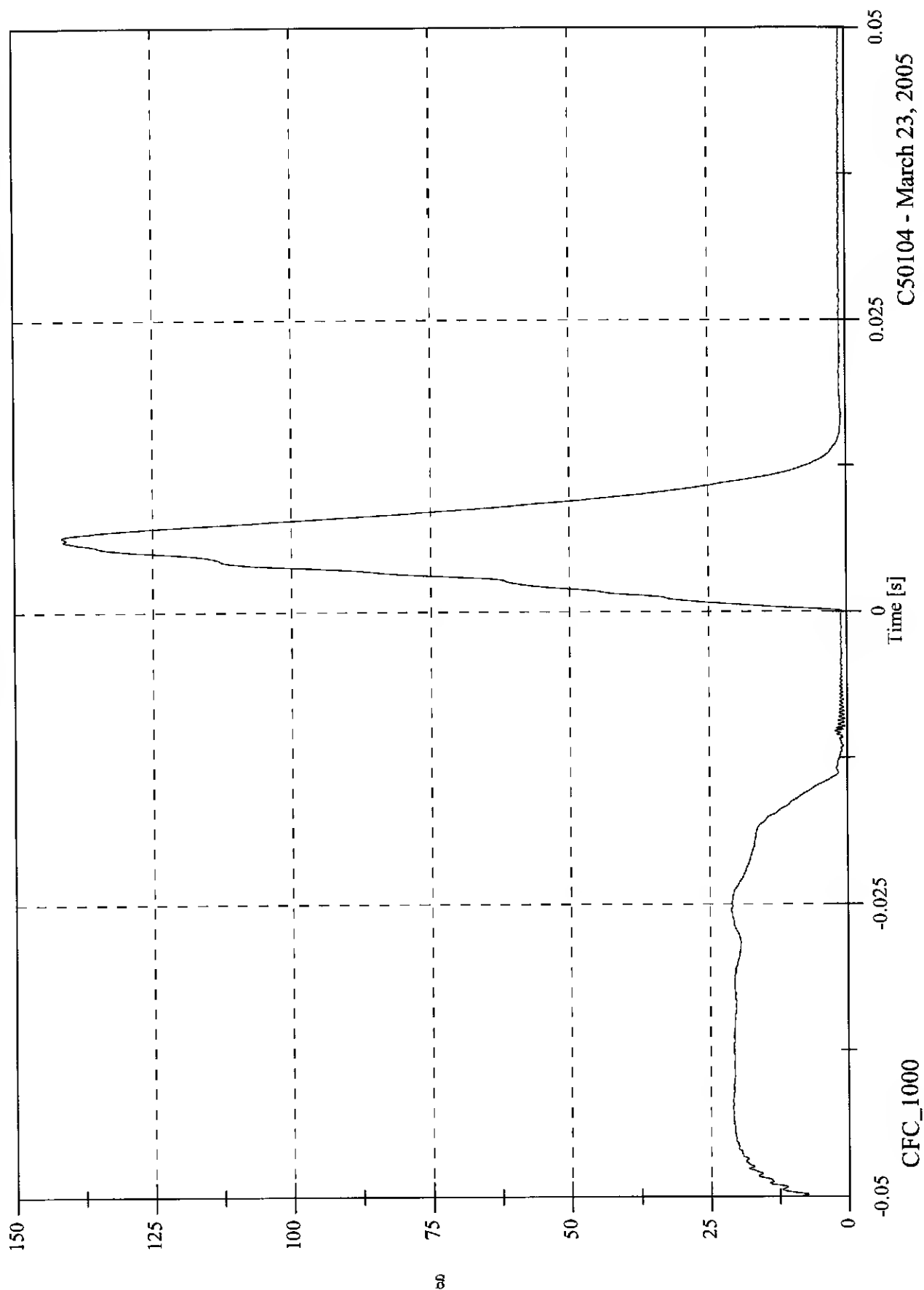
FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse



Max: 141.4 [g] at 0.006 [s]
Min: 0.4 [g] at -0.010 [s]

Headform Resultant

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

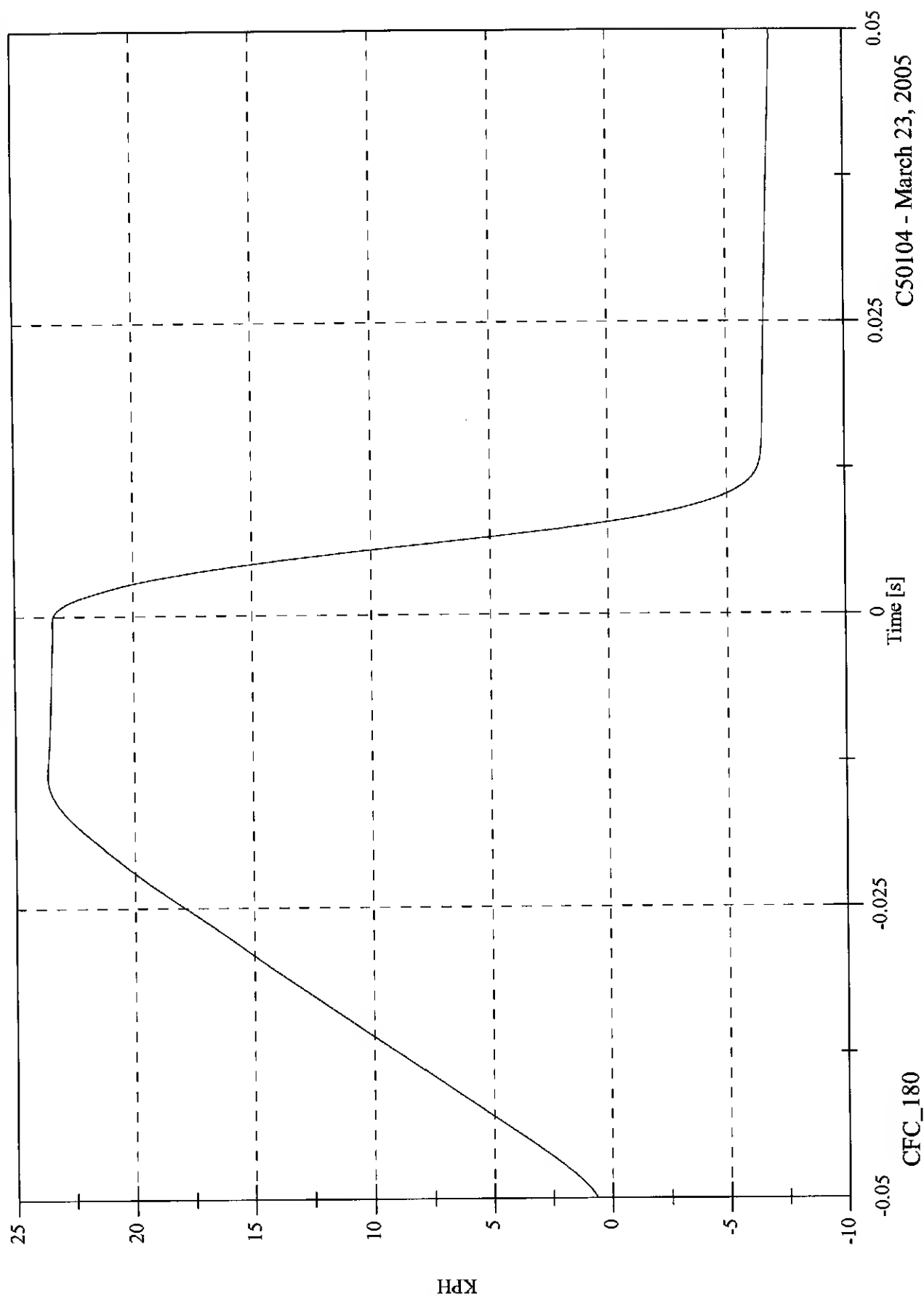


C50104 - March 23, 2005

Max: 23.6 [KPH] at -0.014 [s]
Min: -6.9 [KPH] at 0.050 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

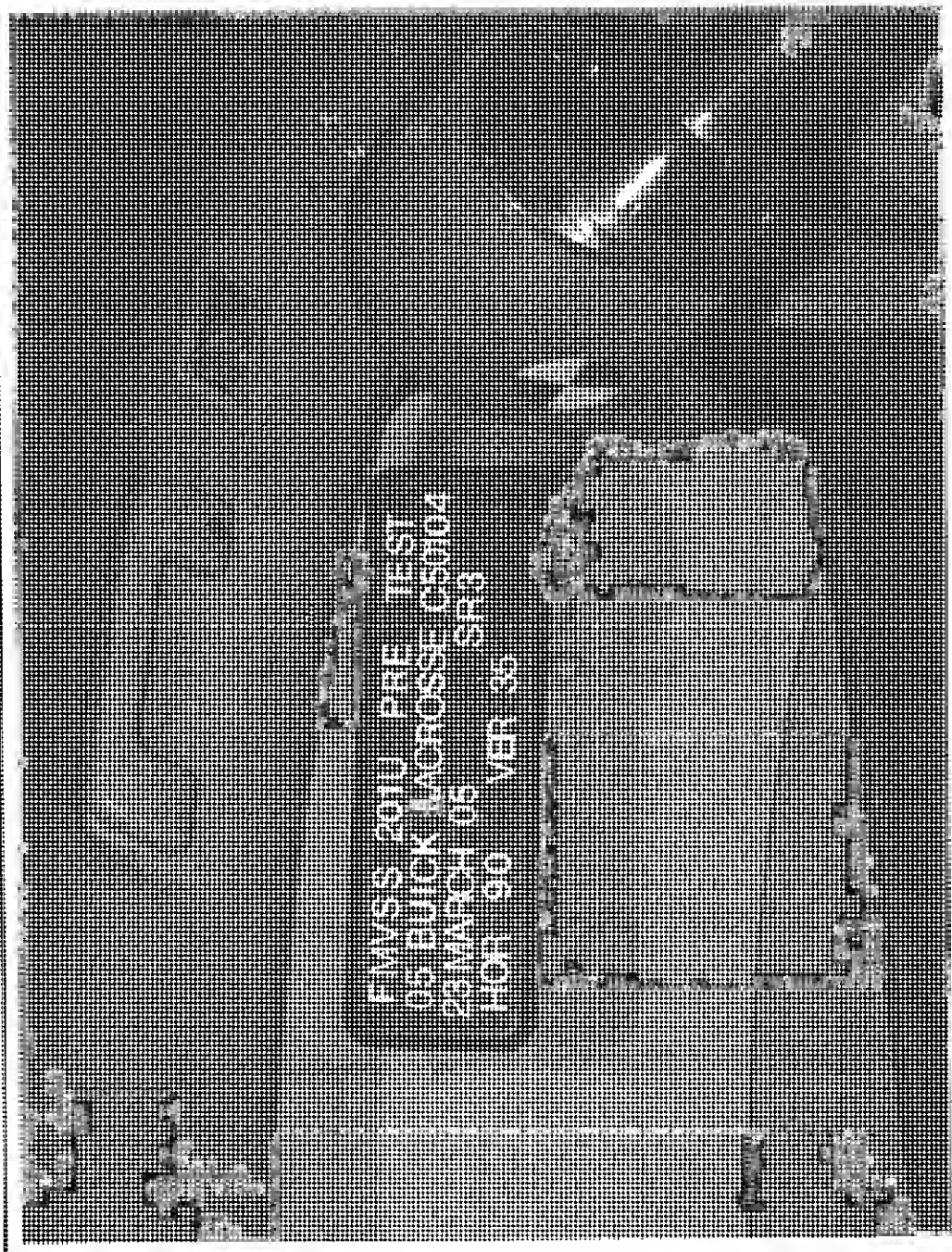
Headform Velocity



CFC_180

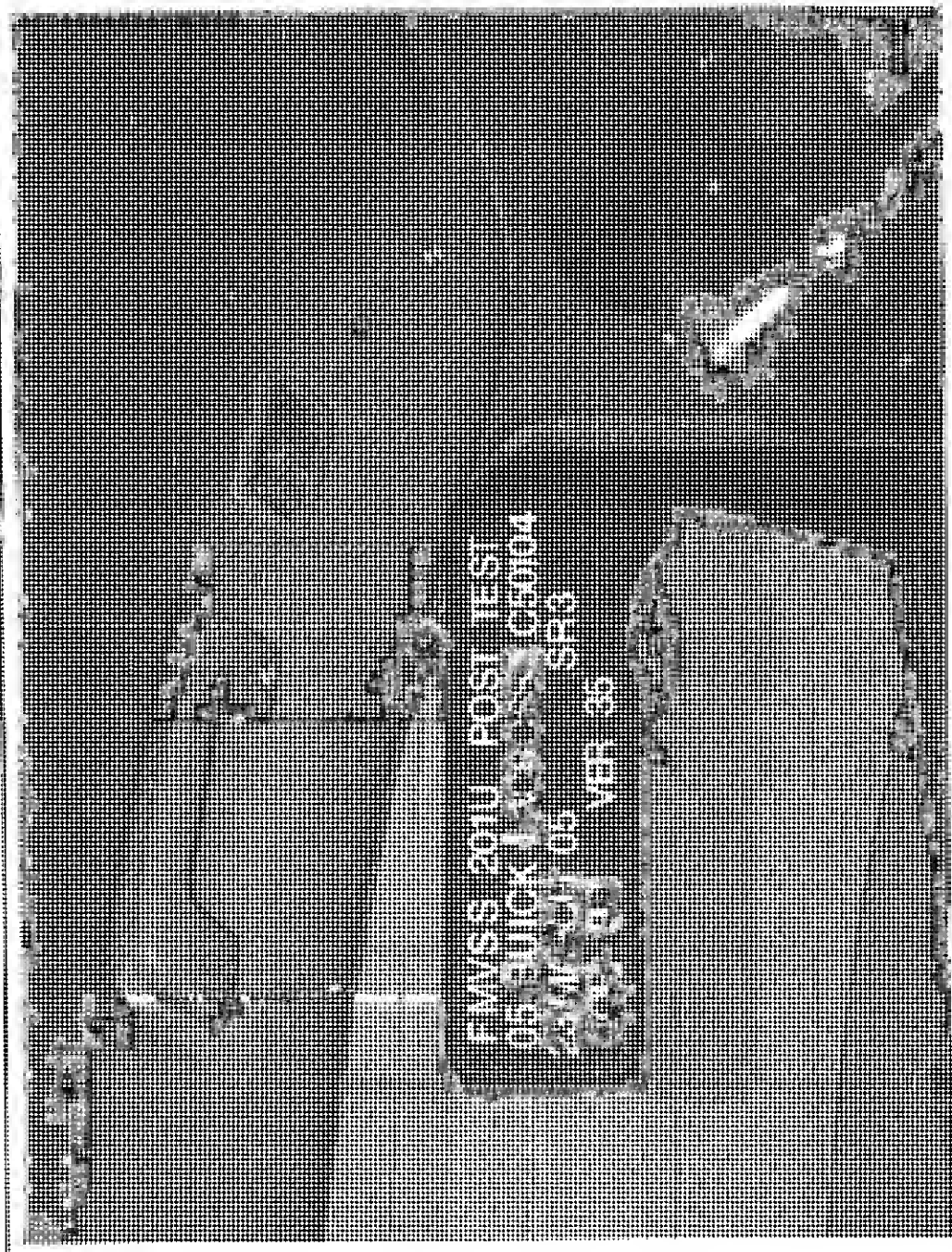
Time [s]

C50104 - March 23, 2005



PRE-IMPACT SR3

8754.FMH-04



POST-IMPACT SR3

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	03
Test Date:	03/23/05
Target Location:	Rear Pillar
Target Code:	RP1
Horizontal Impact Angle:	84°
Vertical Impact Angle:	24°
Ambient Temperature:	24.5C°
Relative Humidity:	14.2
Time of Impact:	10:25
Headform Number:	805

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	15	<input type="checkbox"/> mm right	<input checked="" type="checkbox"/> mm left
On Centerline	10	mm up	



POST-IMPACT RP1 HEADFORM

Free Motion HIC	775.5
HIC(d)	751.5
Impact Velocity (kph)	23.66
HIC T1 (msec)	1.6
HIC T2 (msec)	7.7

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - RP1

FMH Headform 805

Location: RP1

Test Date: March 23, 2005

Work File: RP1

-----TEST RESULTS-----

Lab Temperature: 24.5 C

HICd: 751.5

Lab Humidity: 14.2 %

HIC (36ms): 775.5

Velocity at Impact: 23.66 KPH

t1: 1.6 msec

t2: 7.7 msec

Free Flight Distance: 212.75 mm

Duration: 6.1 msec

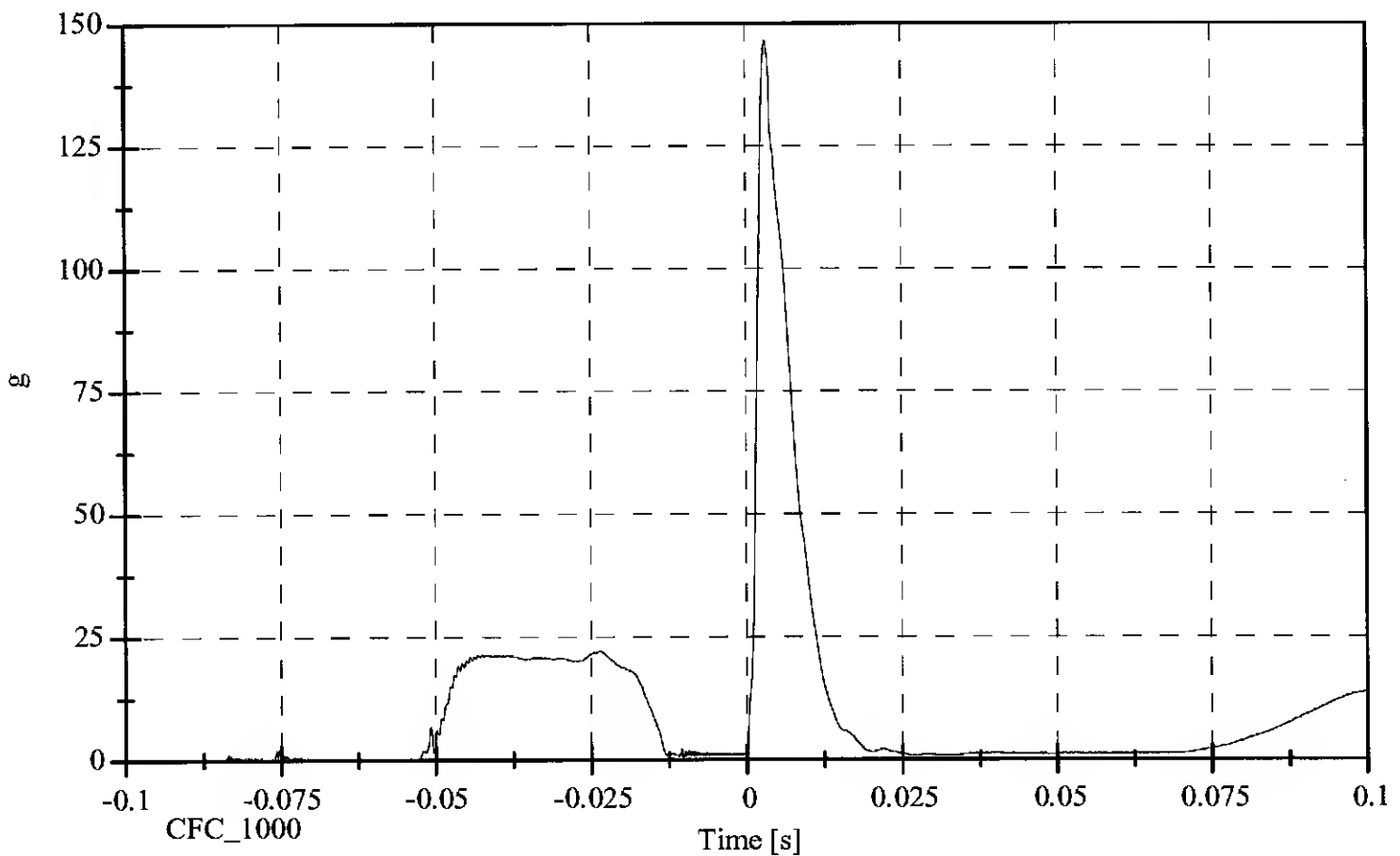
Maximum: 146.5 g

Average Acceleration: 9.5 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Resultant

Max: 146.5 [g] at 0.003 [s]

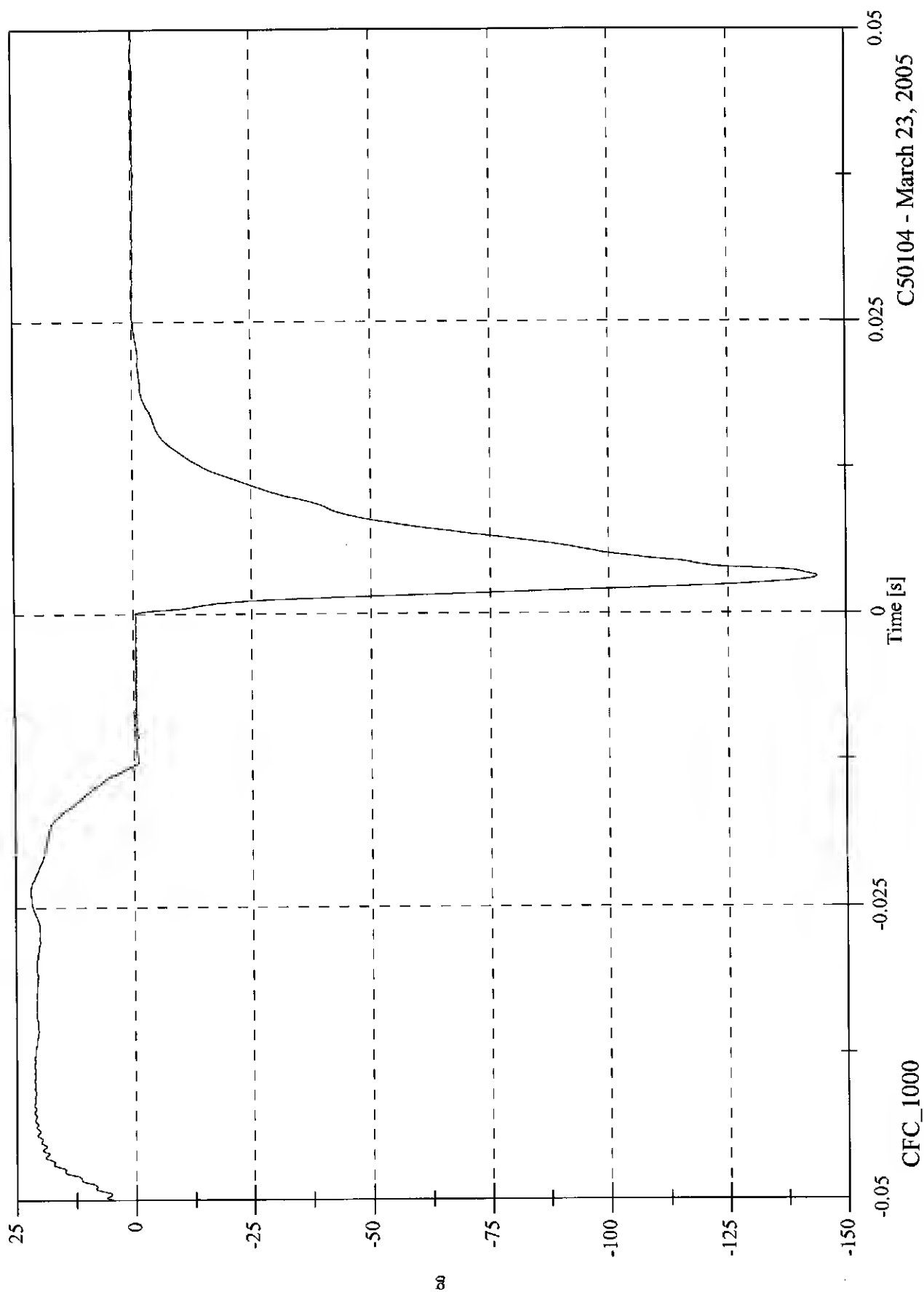
Min: 0.0 [g] at -0.097 [s]



FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform X Acceleration

Max: 21.9 [g] at -0.024 [s]
Min: -143.8 [g] at 0.003 [s]

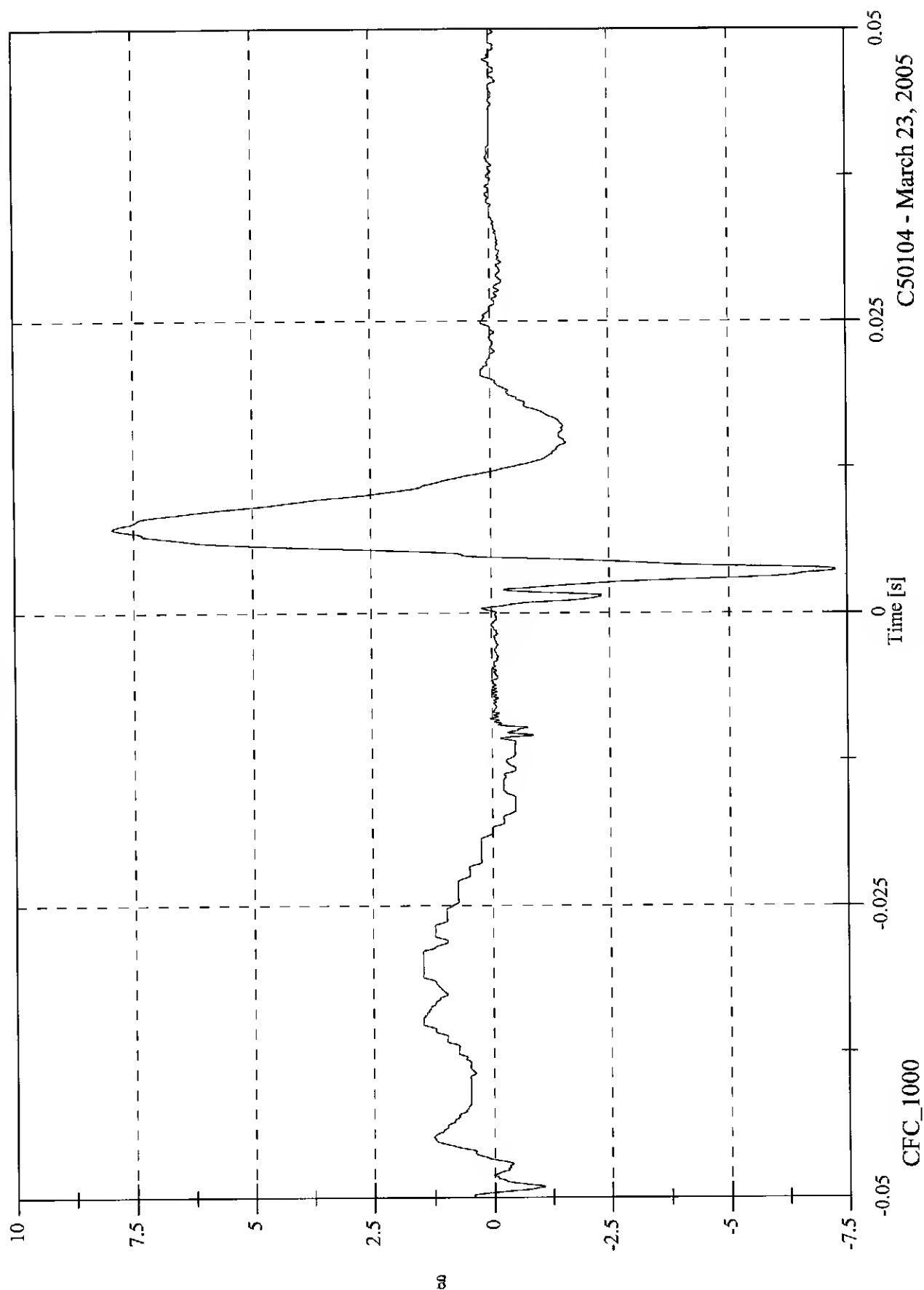


C50104 - March 23, 2005

Max: 7.9 [g] at 0.007 [s]
Min: -7.3 [g] at 0.004 [s]

Headform Y Acceleration

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse



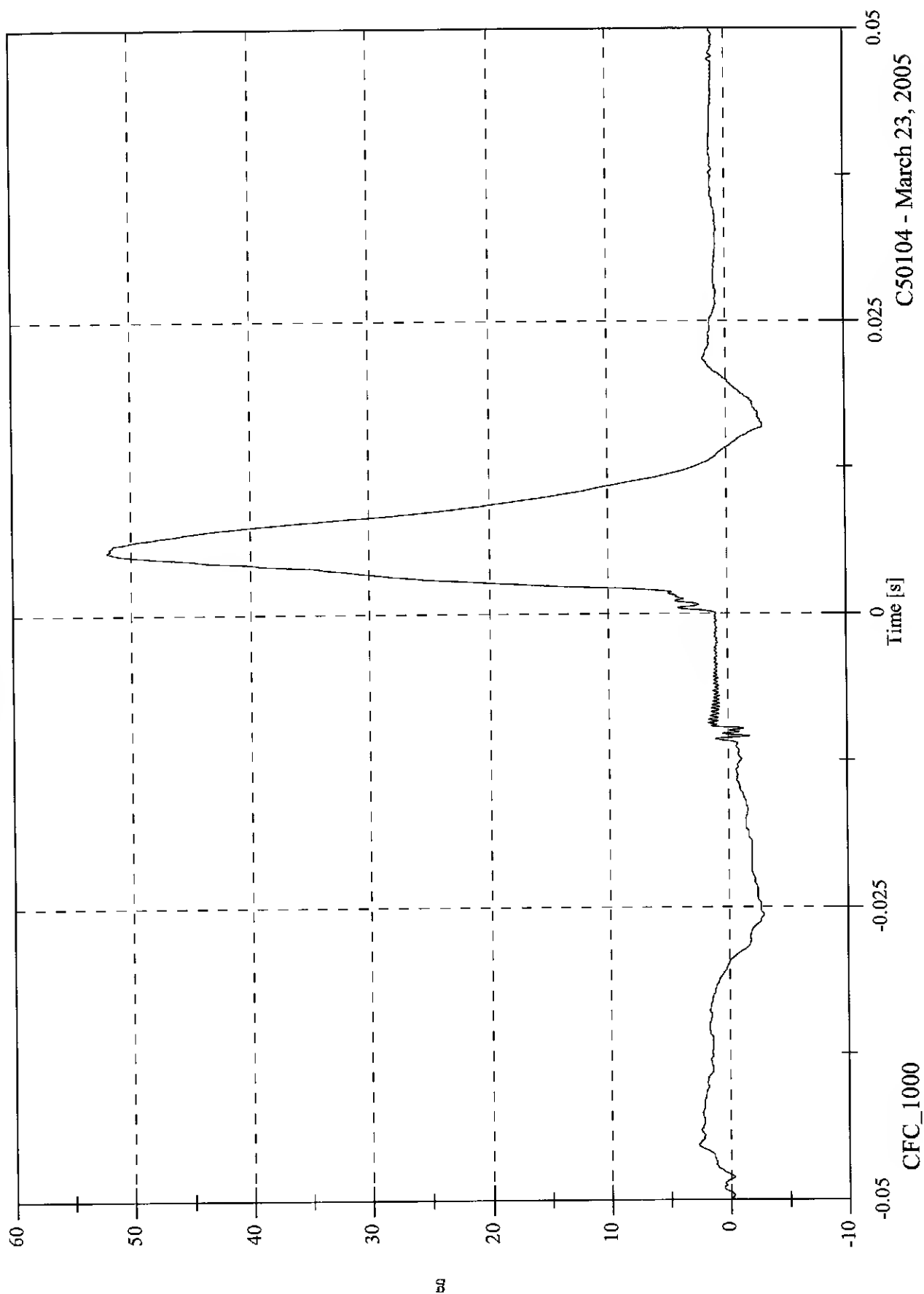
CFC_1000

Time [s]

C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Z Acceleration

Max: 52.0 [g] at 0.005 [s]
Min: -3.1 [g] at 0.016 [s]

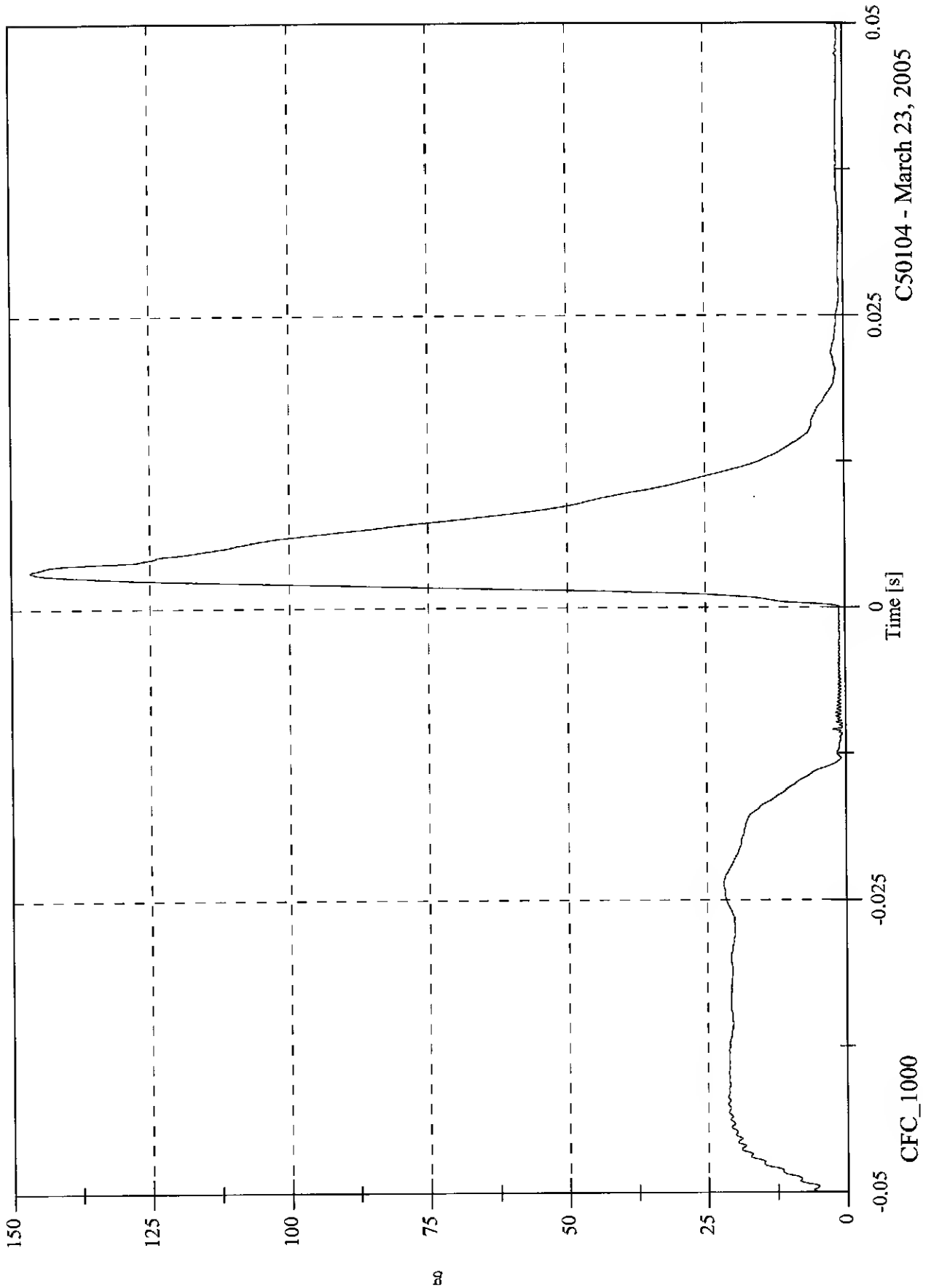


C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Resultant

Max: 146.5 [g] at 0.003 [s]
Min: 0.6 [g] at -0.010 [s]

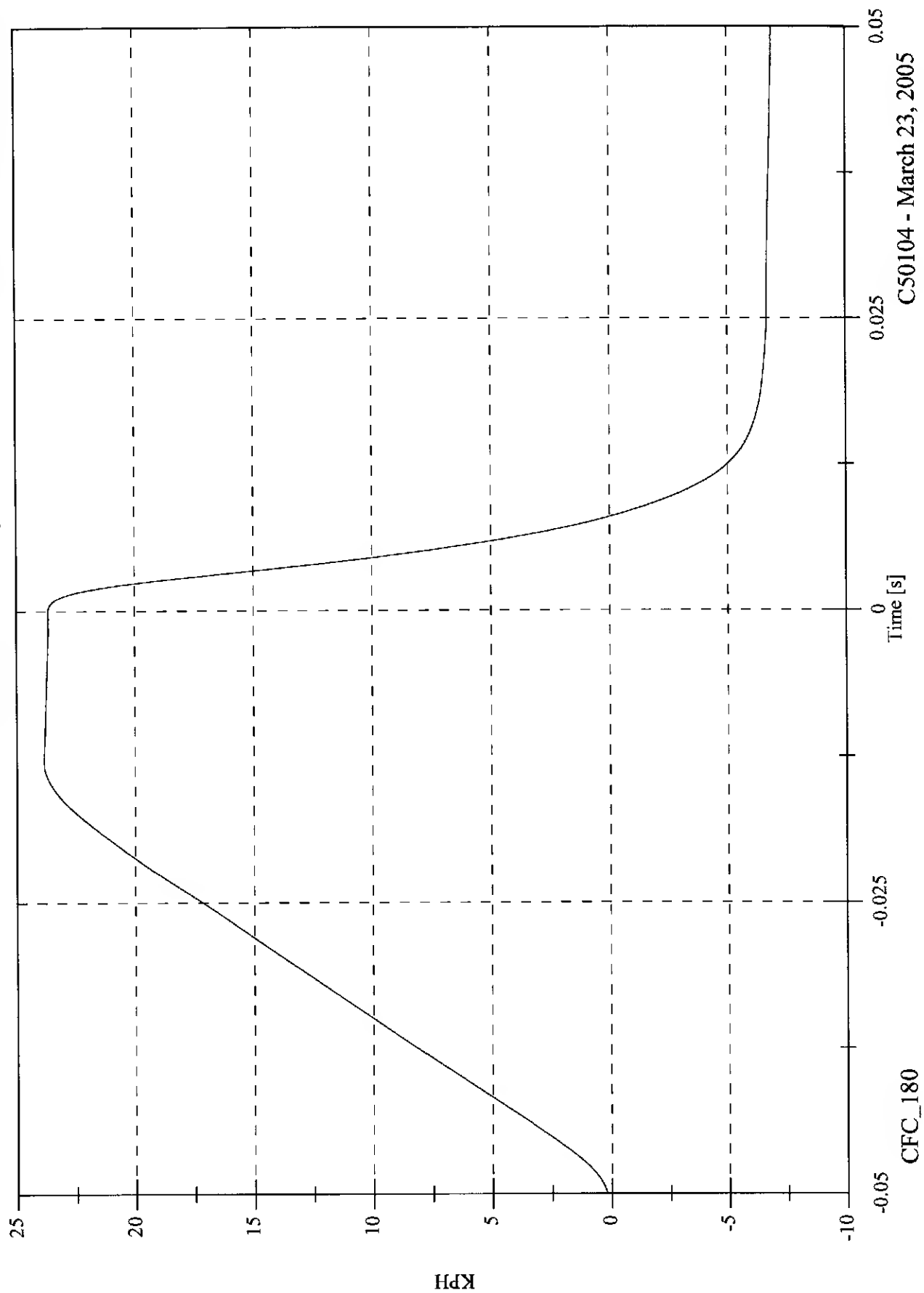


C50104 - March 23, 2005

Max: 23.9 [KPH] at -0.013 [s]
Min: -6.9 [KPH] at 0.050 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Velocity



CFC_180

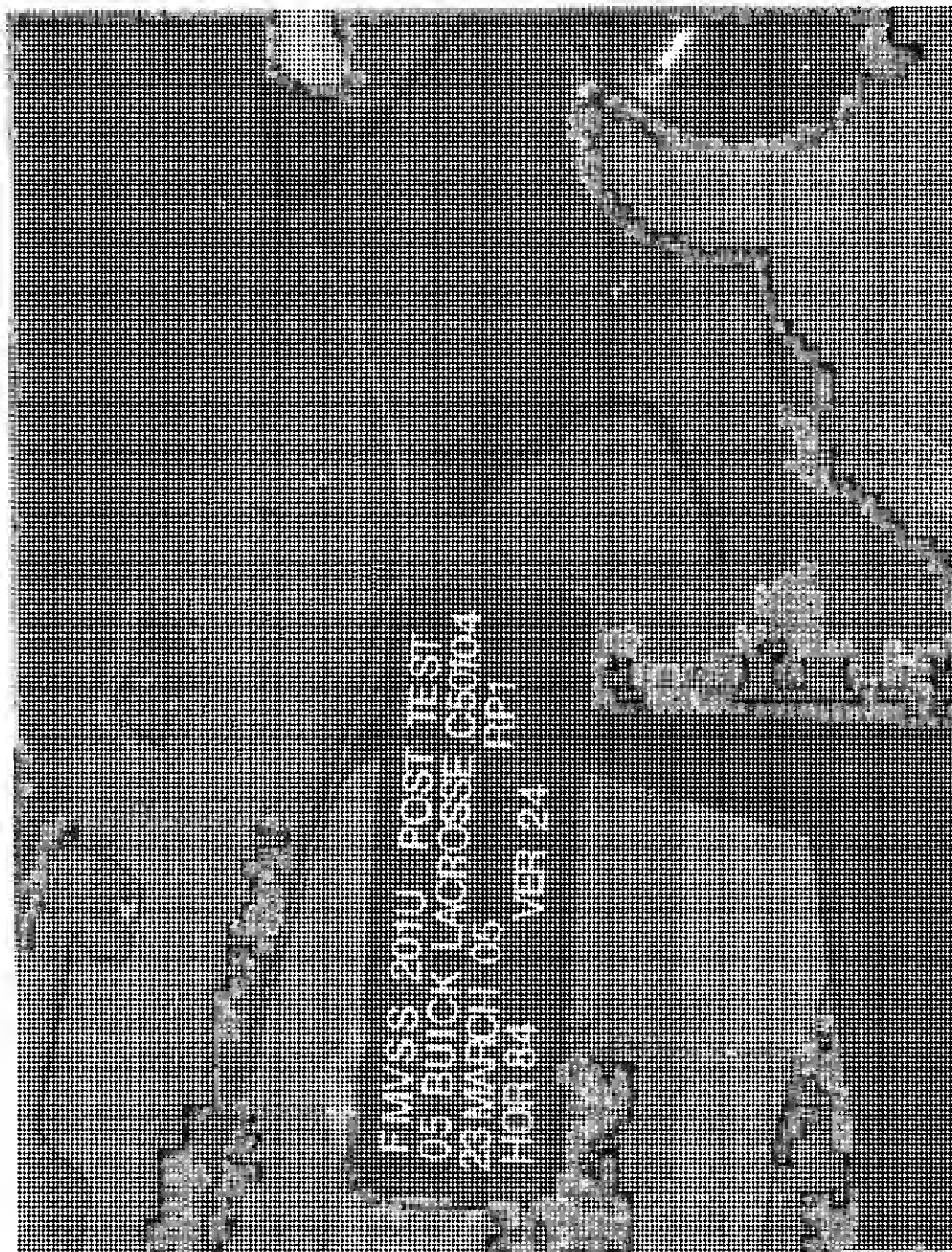
Time [s]

C50104 - March 23, 2005



PRE-IMPACT #1

8754-FMH-04



FMVSS 201U POST TEST
05 BUICK LACROSSE C50104
29 MARCH 05
HGT 84 VER 24
RPI

POST-IMPACT RPI

8794-FMH-08

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	04
Test Date:	03/23/05
Target Location:	B-Pillar
Target Code:	BP3
Horizontal Impact Angle:	90°
Vertical Impact Angle:	-4°
Ambient Temperature:	23.8C°
Relative Humidity:	13.8
Time of Impact:	10:45
Headform Number:	1255

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	45	<input checked="" type="checkbox"/> mm right	<input type="checkbox"/> mm left
On Centerline	10	mm up	



POST-IMPACT BP3 HEADFORM

Free Motion HIC	350.1
HIC(d)	430.5
Impact Velocity (kph)	23.64
HIC T1 (msec)	2.6
HIC T2 (msec)	12.5

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - BP3

FMH Headform 1255

Location: BP3

Test Date: March 23, 2005

Work File: BP3

-----TEST RESULTS-----

Lab Temperature: 23.8 C

HICd: 430.5

Lab Humidity: 13.8 %

HIC (36ms): 350.1

Velocity at Impact: 23.64 KPH

t1: 2.6 msec

t2: 12.5 msec

Free Flight Distance: 212.45 mm

Duration: 9.9 msec

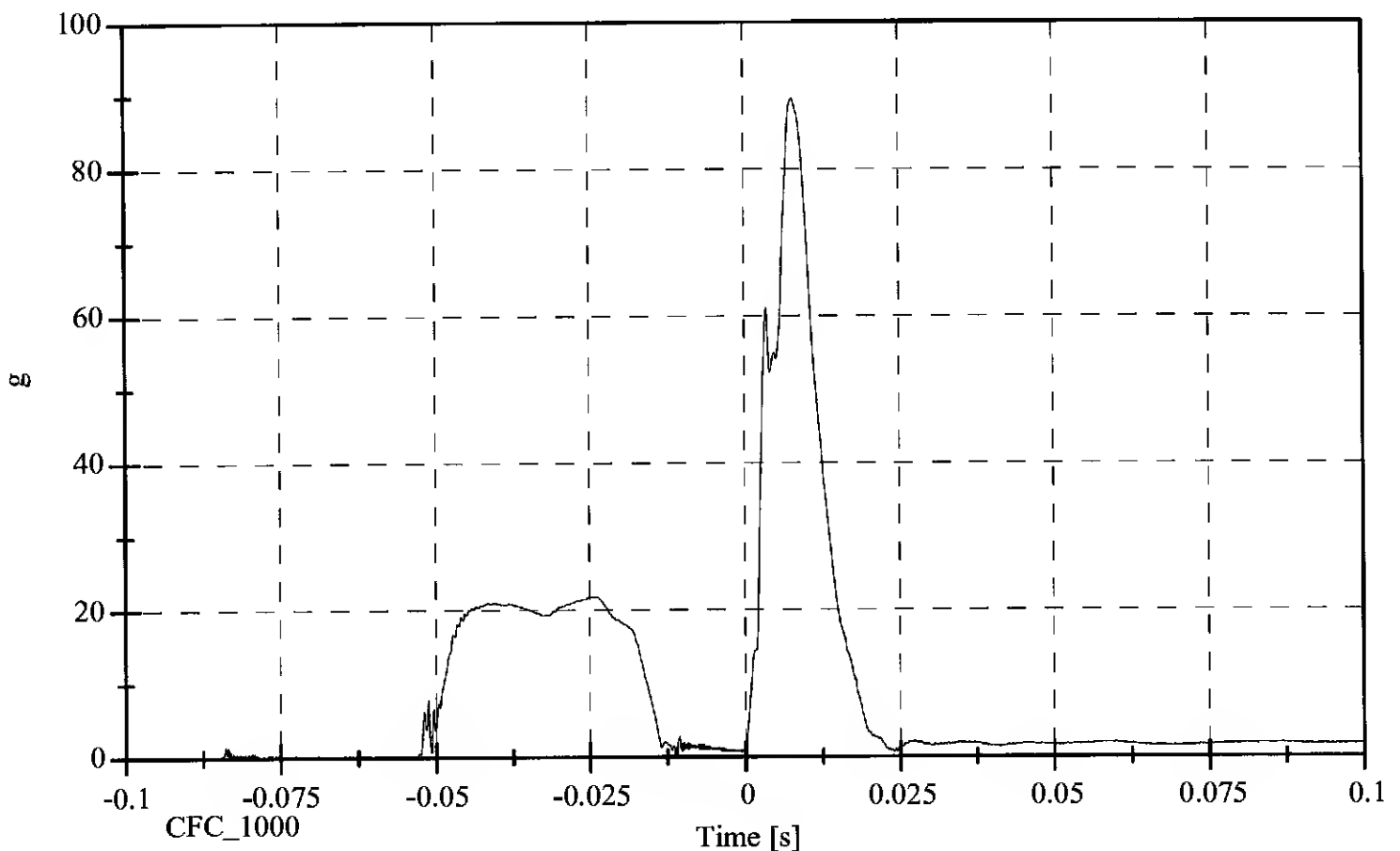
Maximum: 89.6 g

Average Acceleration: 8.3 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Resultant

Max: 89.6 [g] at 0.008 [s]

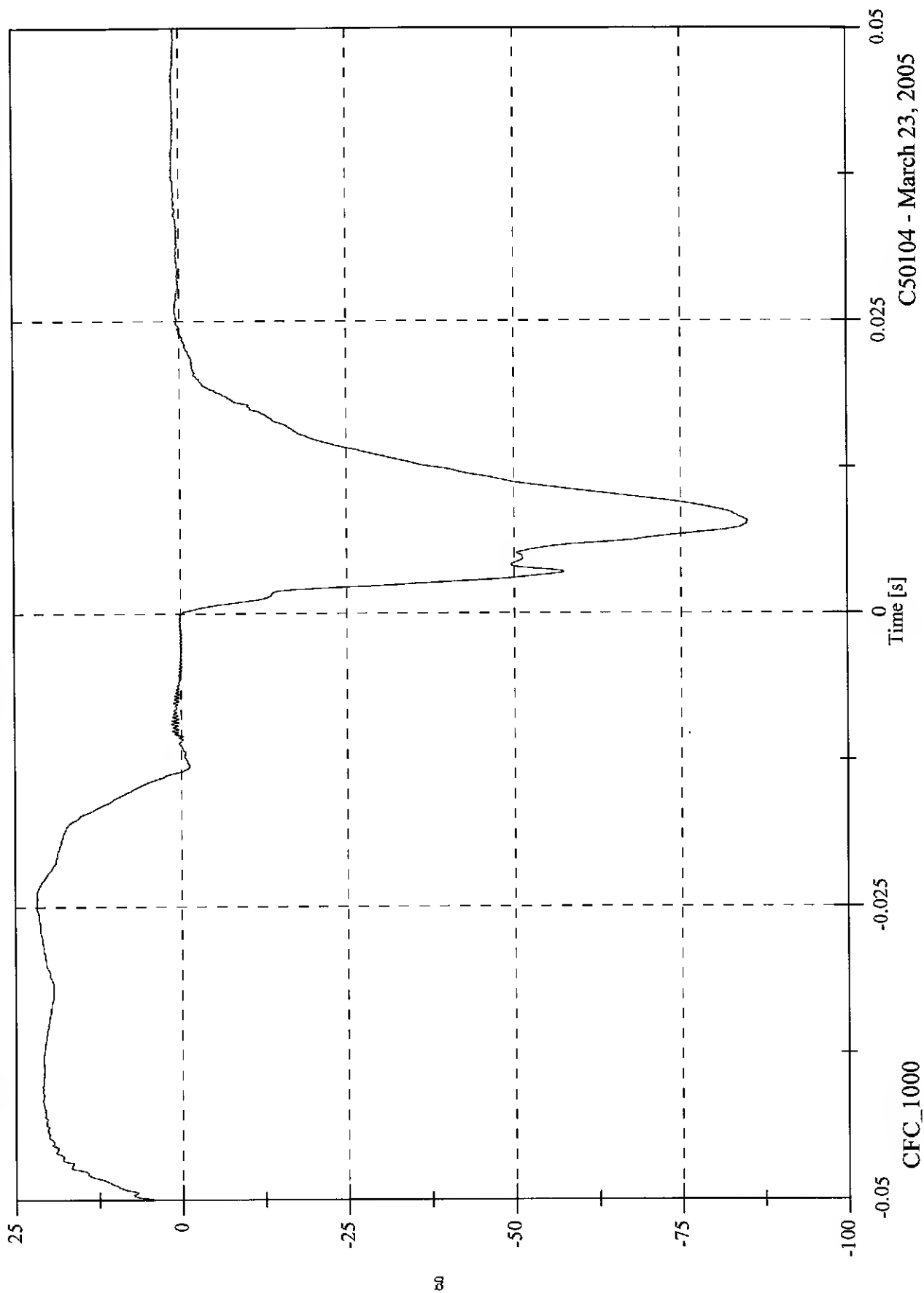
Min: 0.0 [g] at -0.055 [s]



FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform X Acceleration

Max: 21.8 [g] at -0.025 [s]

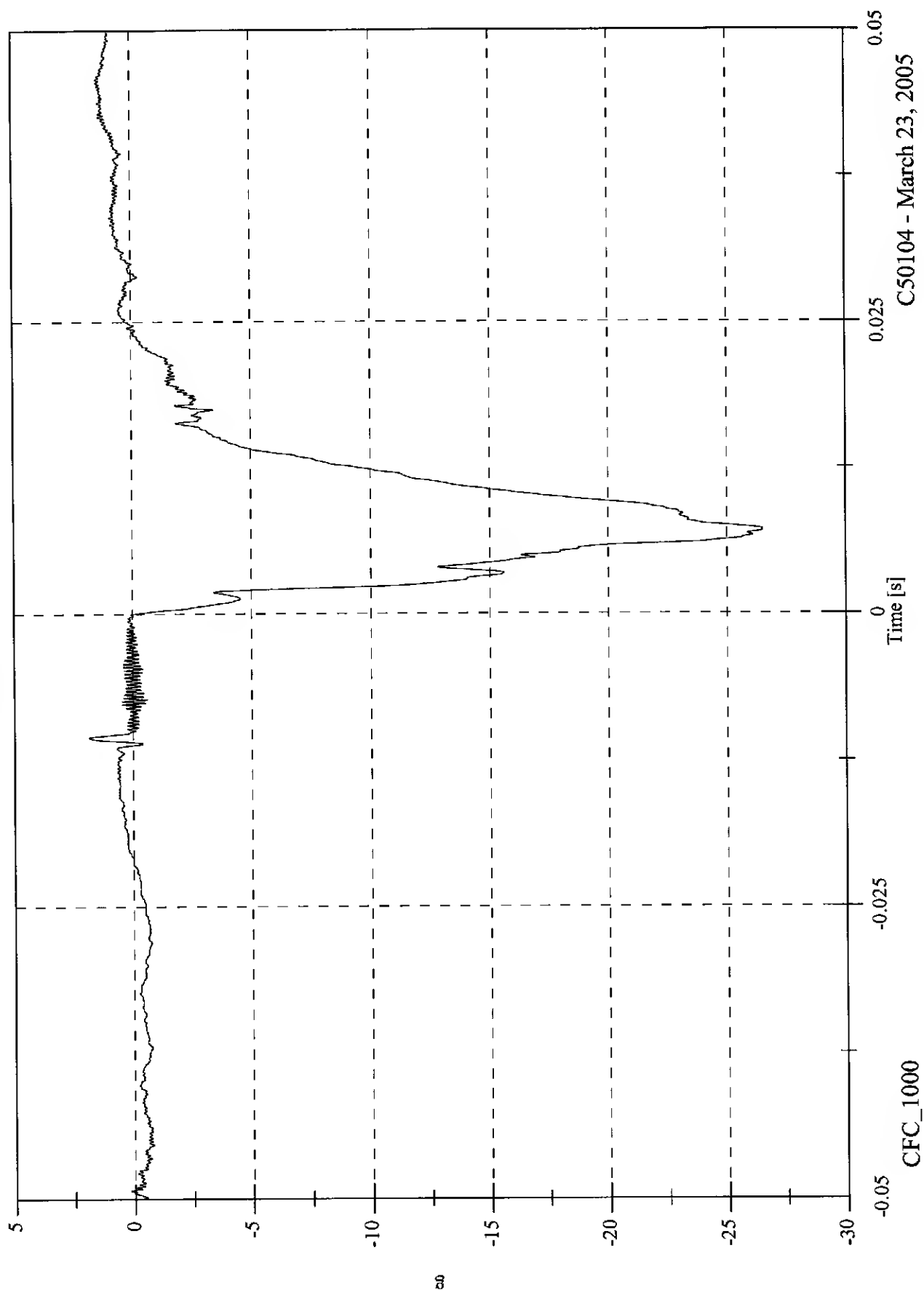
Min: -85.1 [g] at 0.008 [s]



C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Y Acceleration

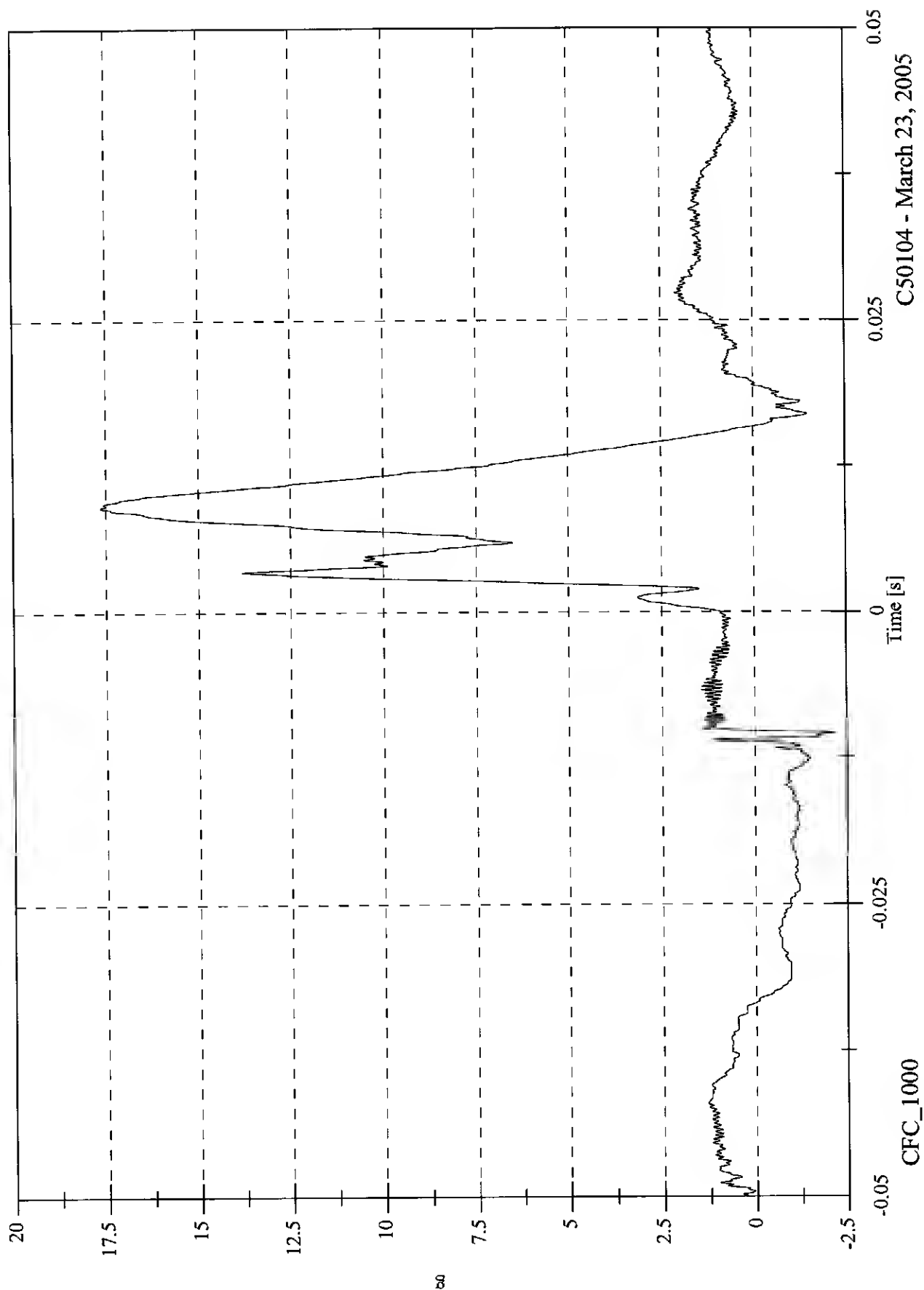
Max: 1.9 [g] at -0.010 [s]
Min: -26.5 [g] at 0.007 [s]



C50104 - March 23, 2005

Max: 17.7 [g] at 0.009 [s]
Min: -2.2 [g] at -0.010 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Z Acceleration

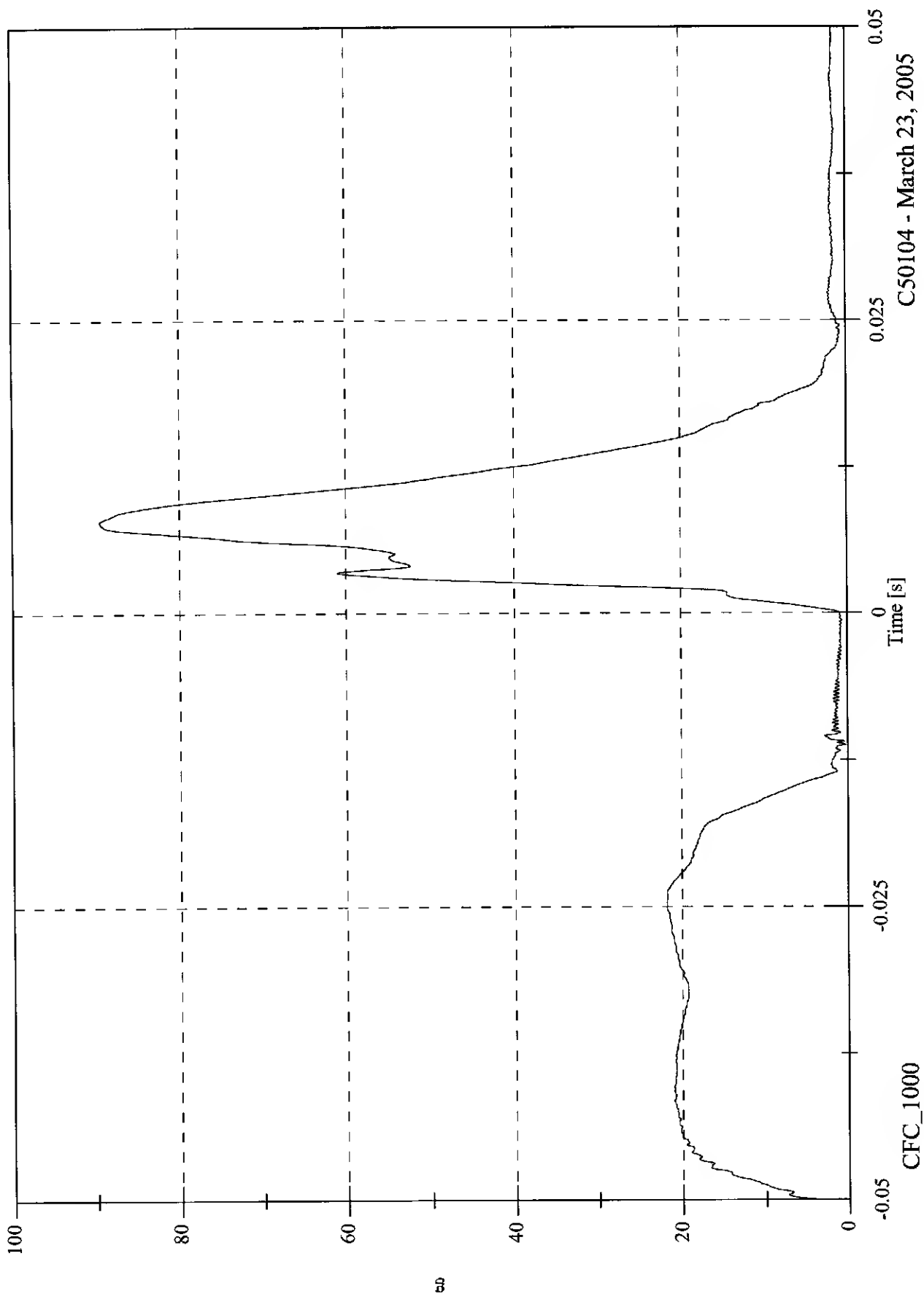


C50104 - March 23, 2005

Max: 89.6 [g] at 0.008 [s]
Min: 0.2 [g] at -0.011 [s]

Headform Resultant

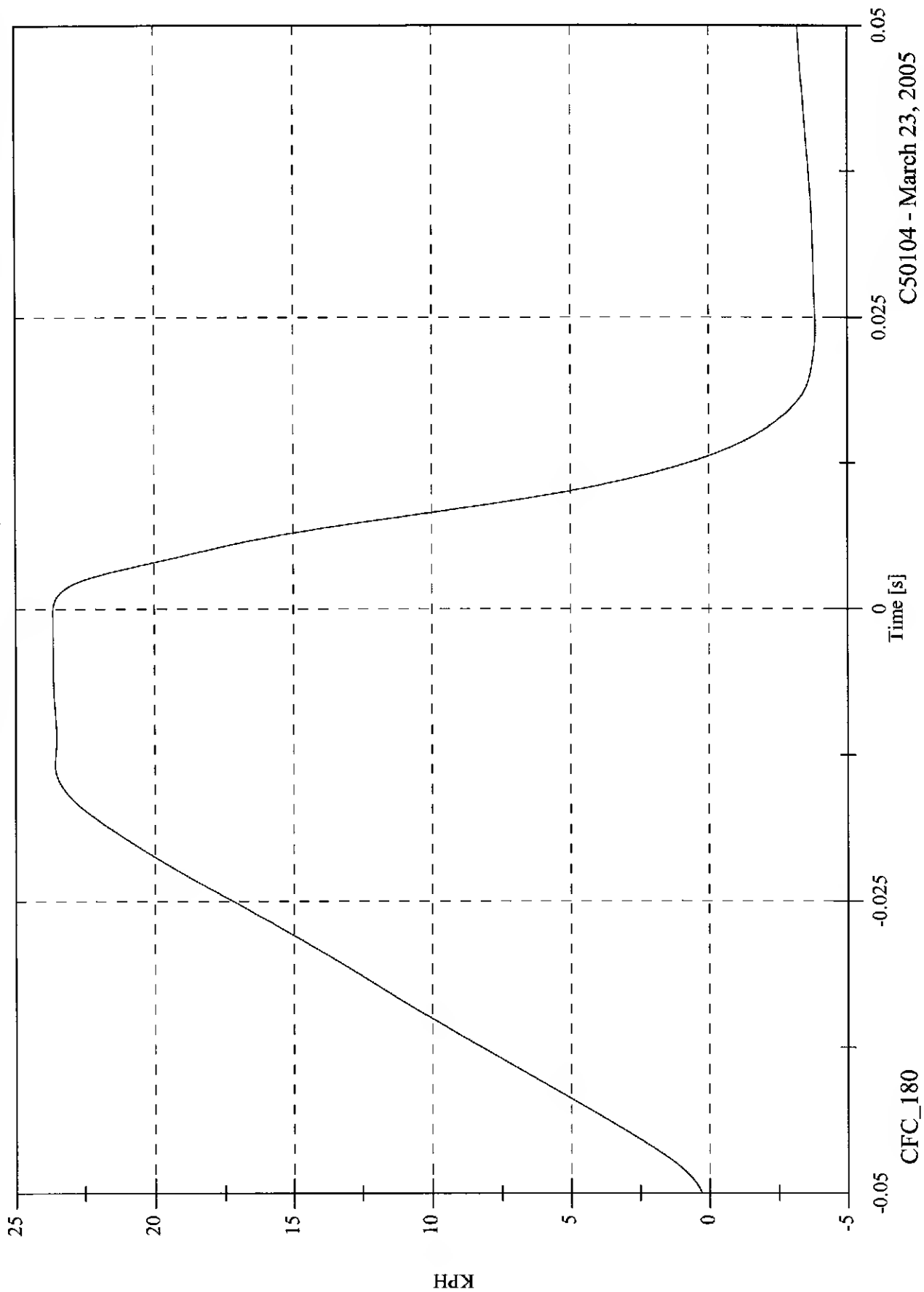
FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse



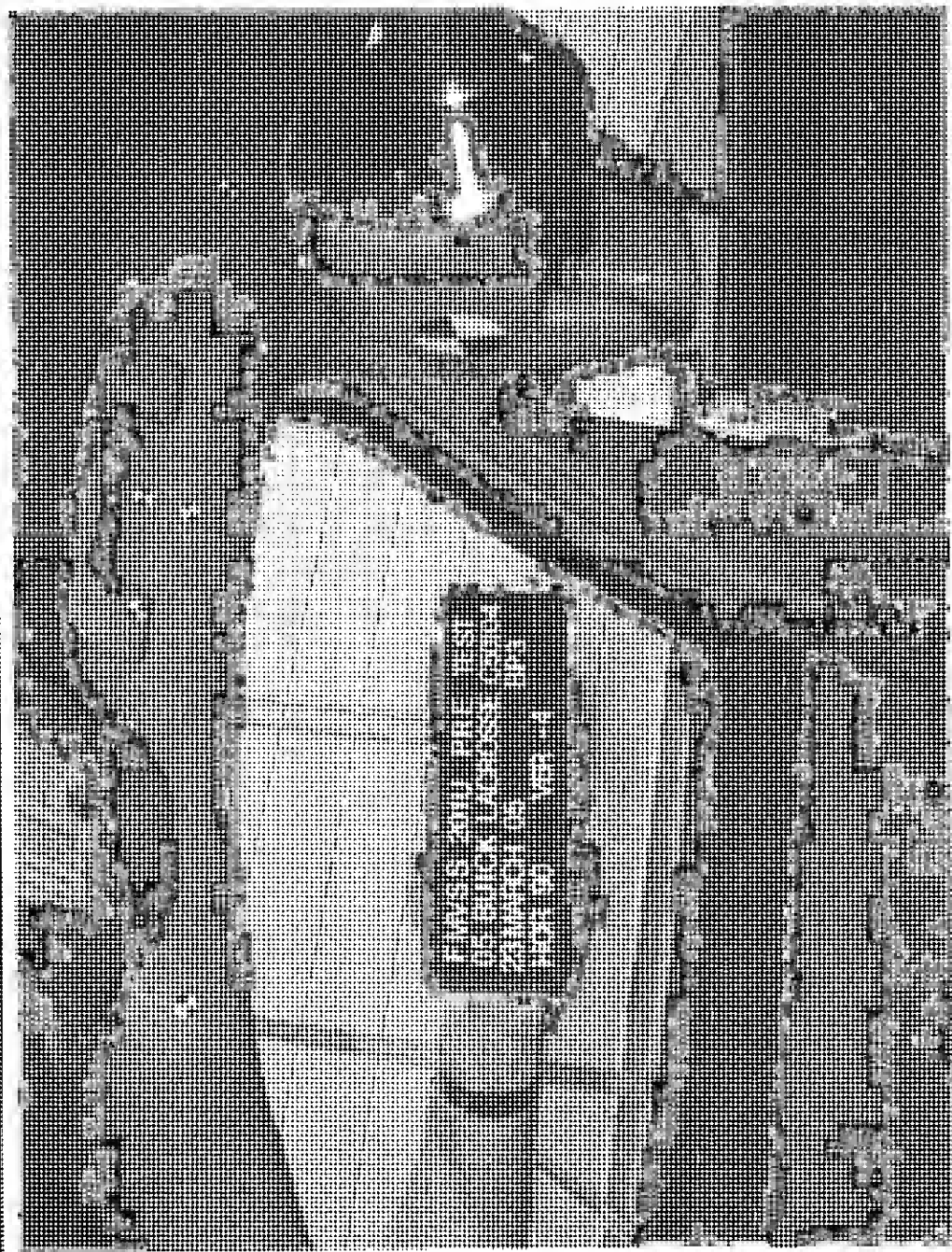
C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Max: 23.6 [KPH] at -0.000 [s]
Min: -3.8 [KPH] at 0.024 [s]

Headform Velocity

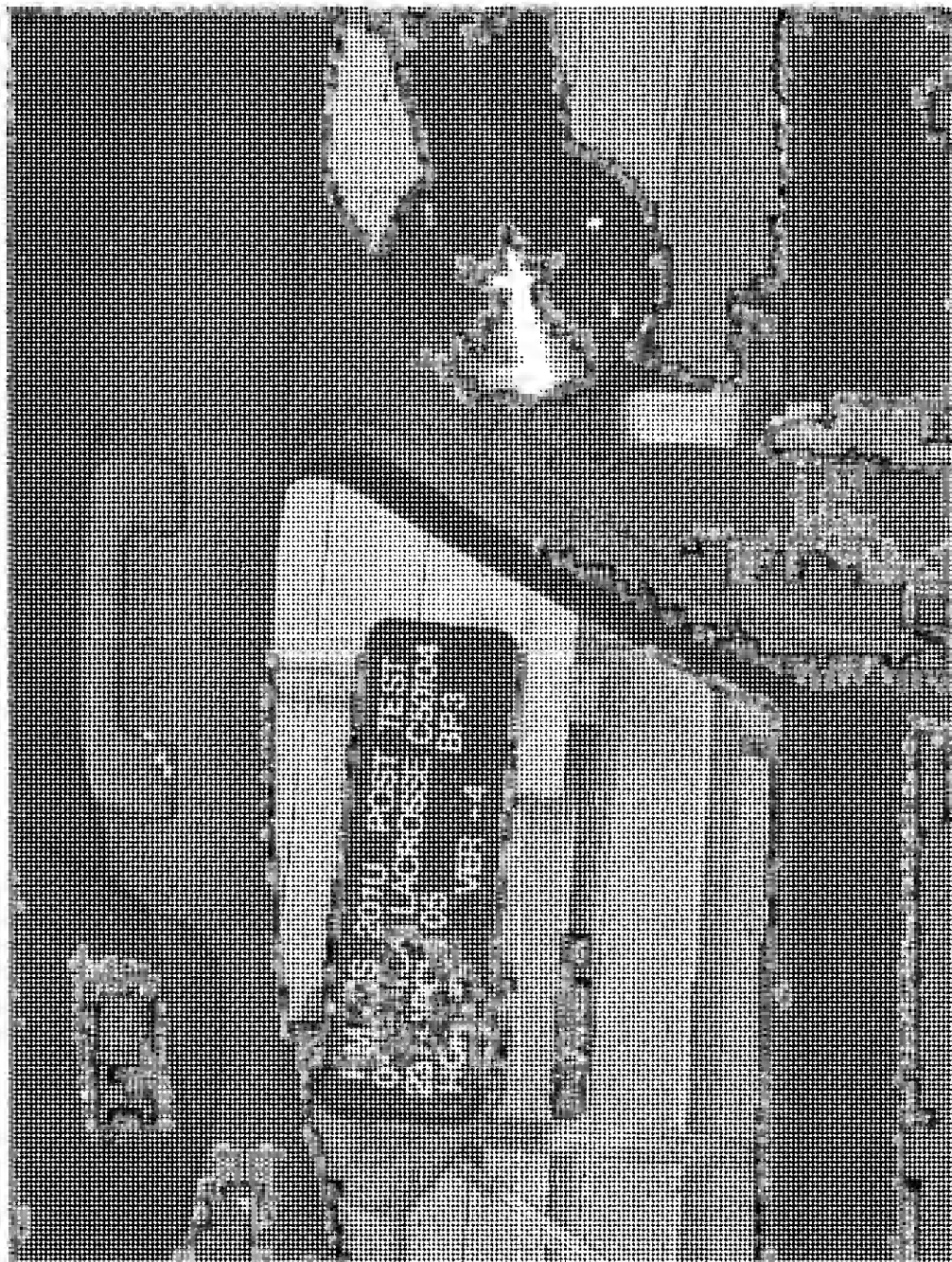


CFC_180



PRE-IMPACT HP3

8754-FMH-04

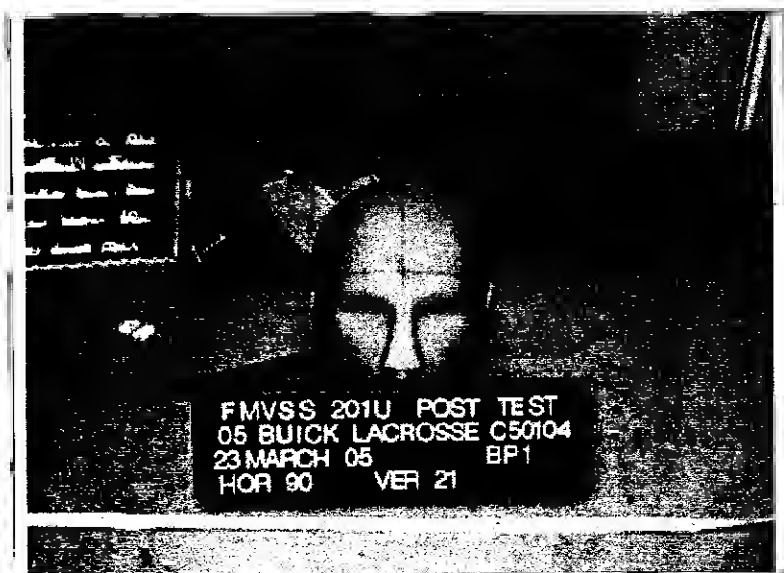


POST-IMPACT BP3

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	05
Test Date:	03/23/05
Target Location:	B-Pillar
Target Code:	BP1
Horizontal Impact Angle:	90°
Vertical Impact Angle:	21°
Ambient Temperature:	24.3C°
Relative Humidity:	13.4
Time of Impact:	11:25
Headform Number:	642

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	5	<input checked="" type="checkbox"/> mm right	<input type="checkbox"/> mm left
On Centerline	8	mm up	



POST-IMPACT BP1 HEADFORM

Free Motion HIC	711.2
HIC(d)	703
Impact Velocity (kph)	23.72
HIC T1 (msec)	2.4
HIC T2 (msec)	9.3

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - BP1

FMH Headform 0642

Location: BP1

Test Date: March 23, 2005

Work File: BP1

-----TEST RESULTS-----

Lab Temperature: 24.3 C

HICd: 703.0

Lab Humidity: 13.4 %

HIC (36ms): 711.2

Velocity at Impact: 23.72 KPH

t1: 2.4 msec

t2: 9.3 msec

Free Flight Distance: 212.34 mm

Duration: 6.8 msec

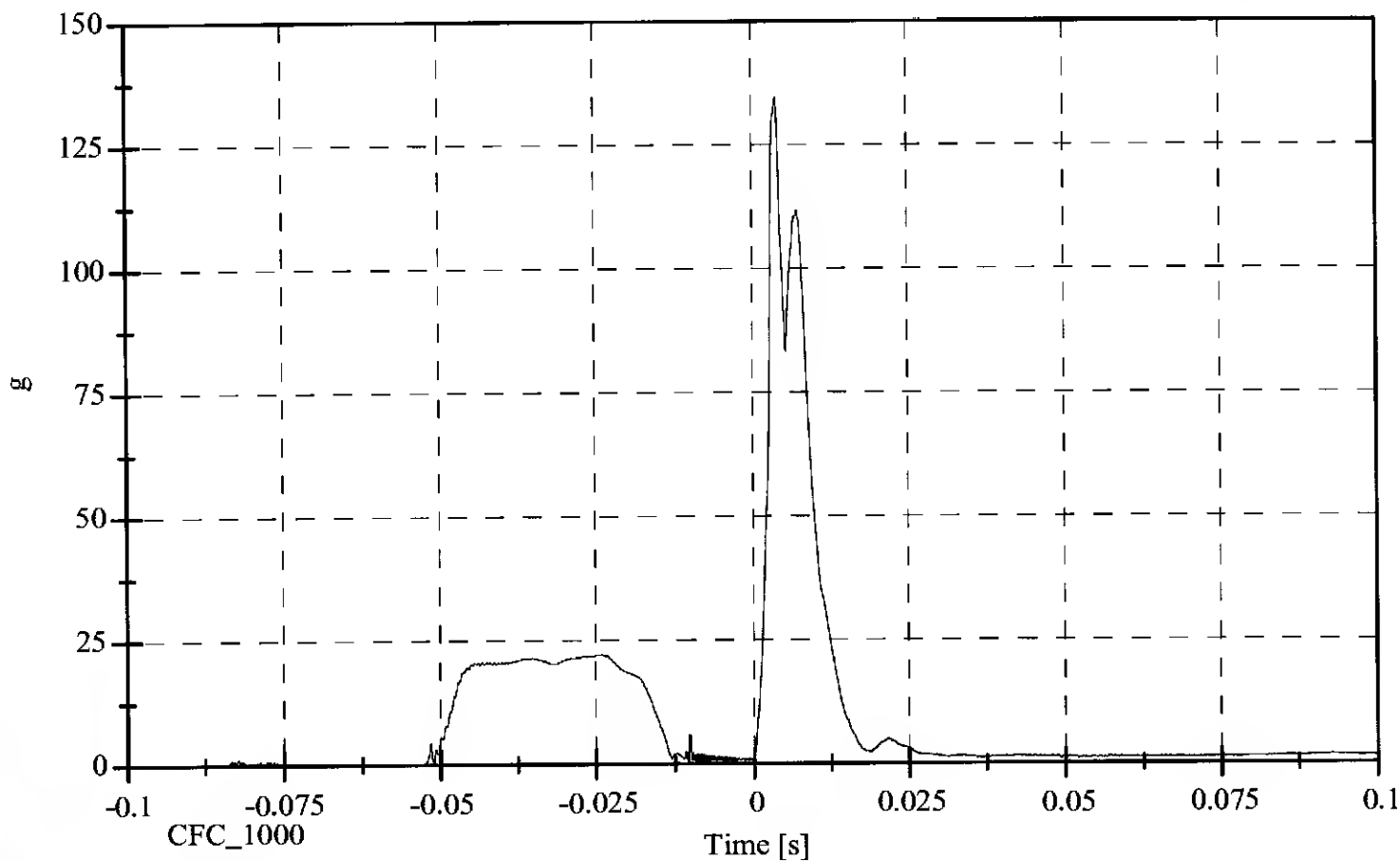
Maximum: 134.5 g

Average Acceleration: 8.9 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Resultant

Max: 134.5 [g] at 0.004 [s]

Min: 0.0 [g] at -0.098 [s]

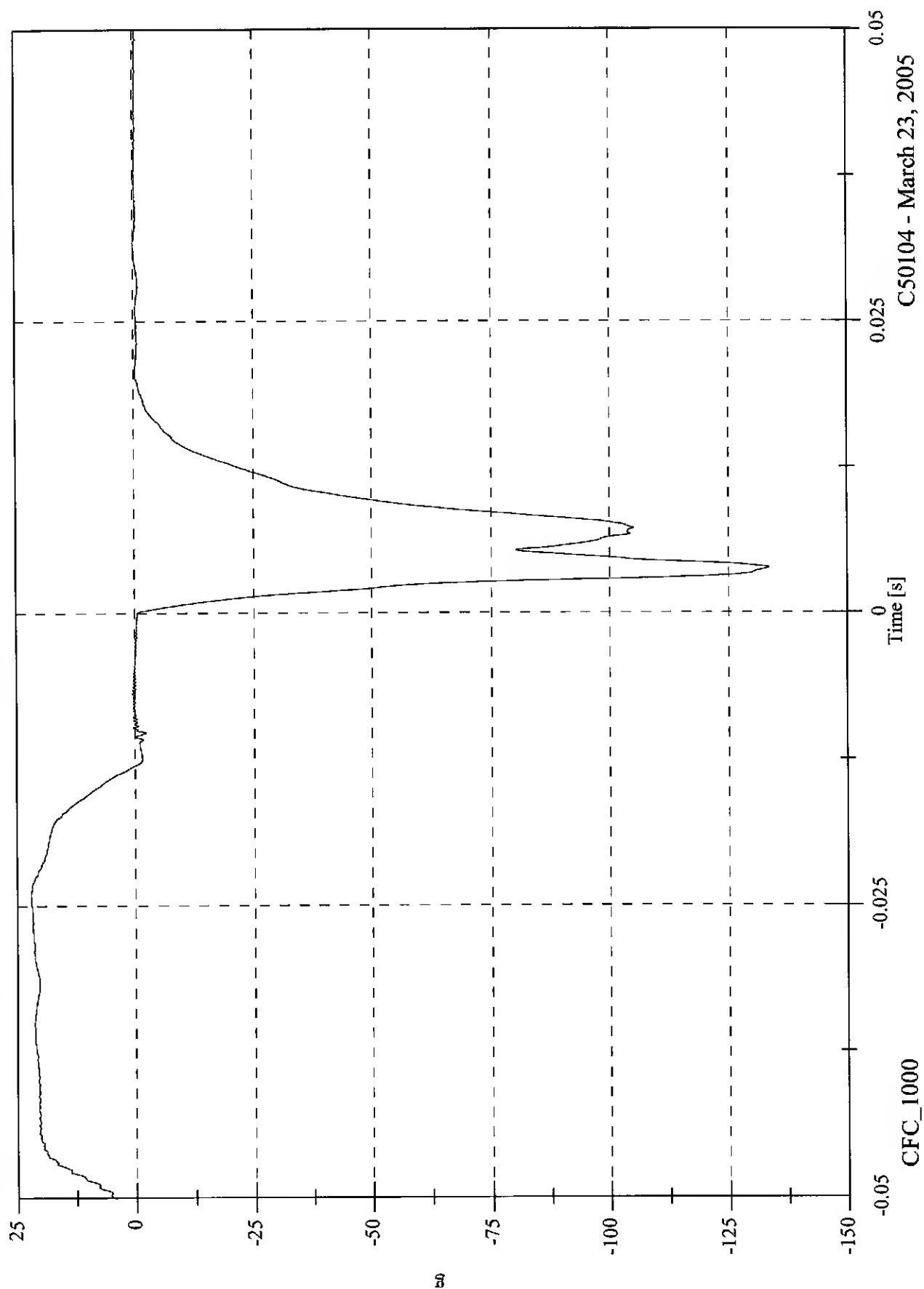


FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform X Acceleration

Max: 22.0 [g] at -0.024 [s]

Min: -133.5 [g] at 0.004 [s]



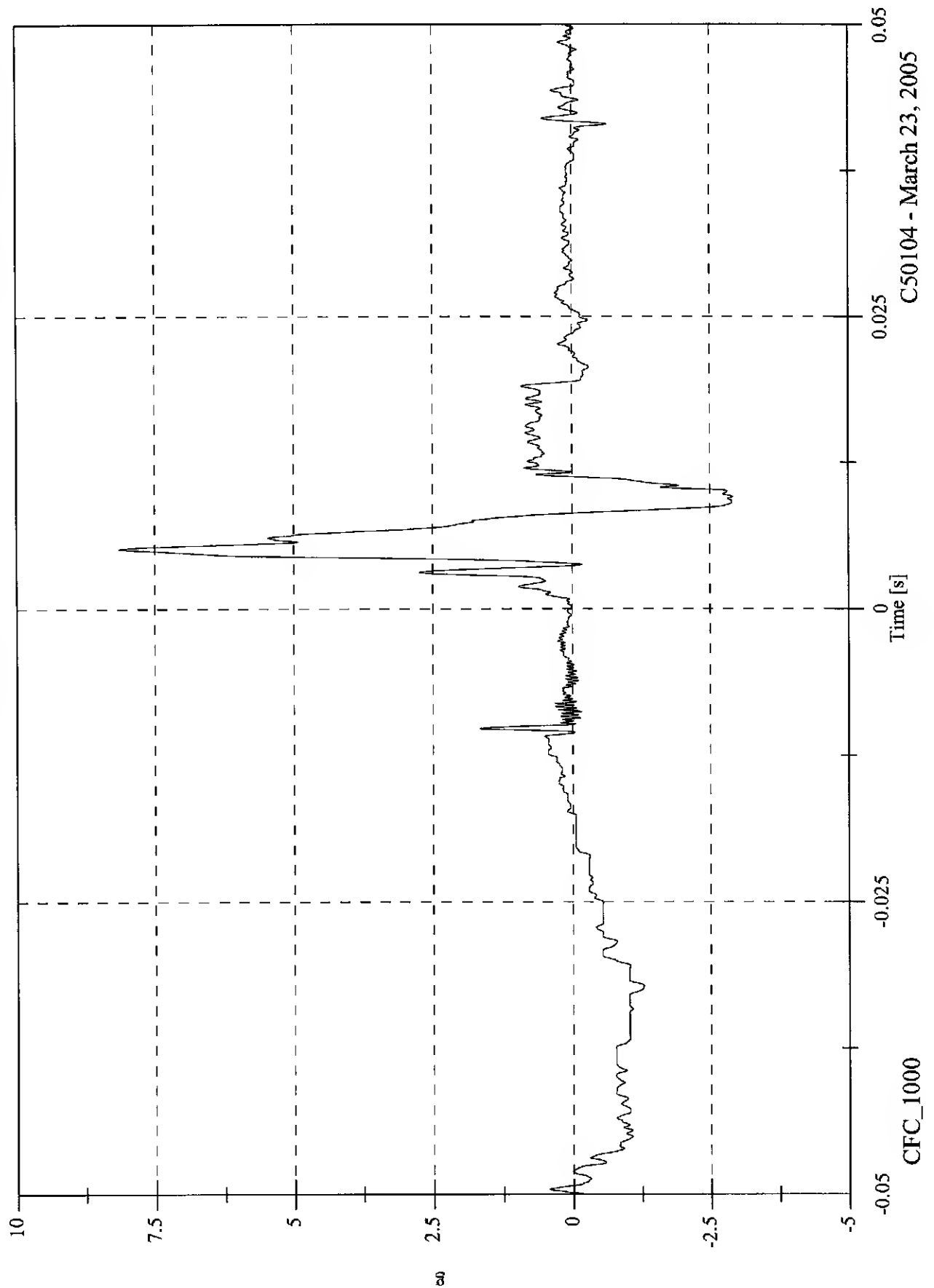
C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Y Acceleration

Max: 8.1 [g] at 0.005 [s]

Min: -2.9 [g] at 0.010 [s]



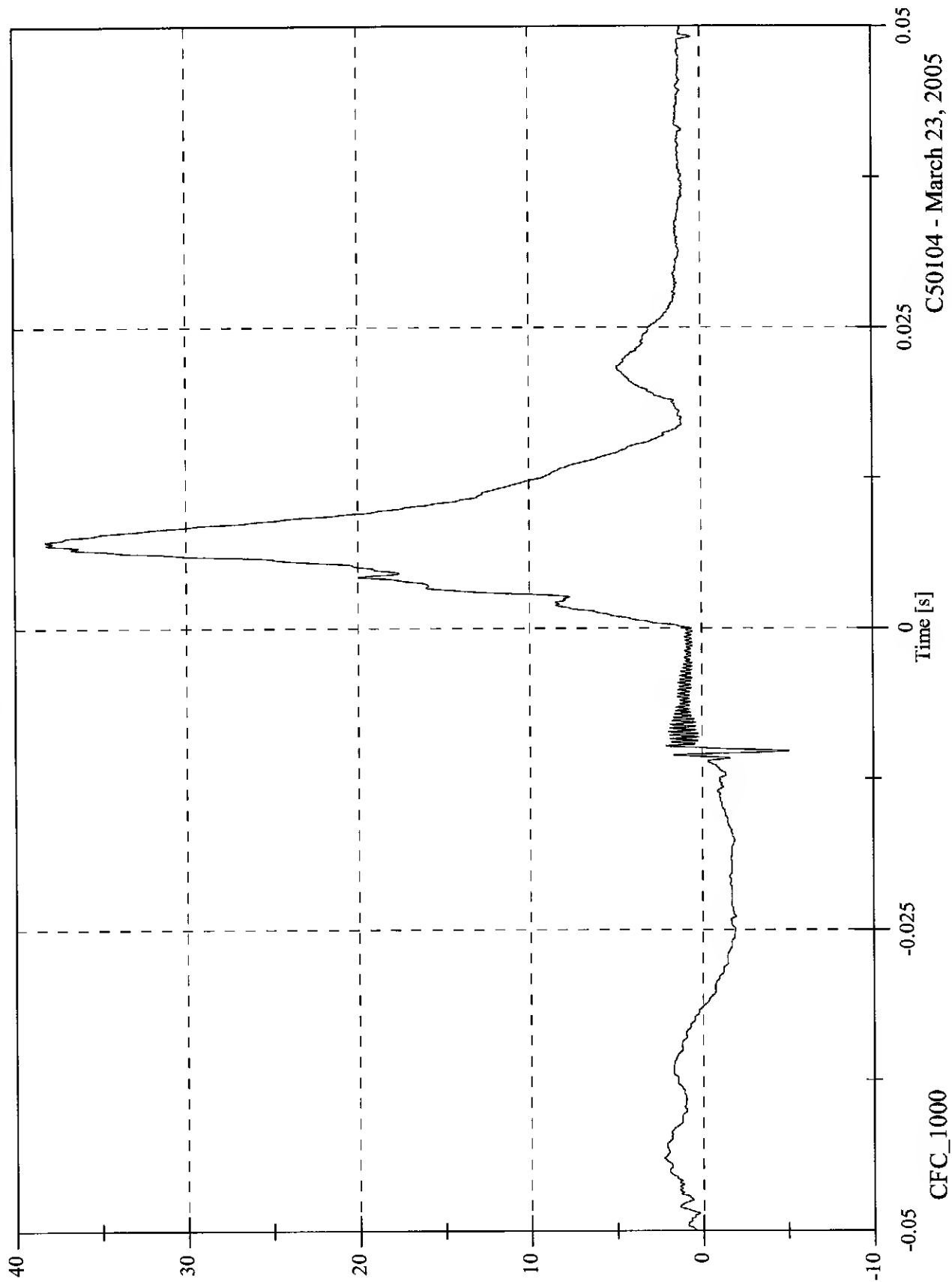
CFC_1000

C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Z Acceleration

Max: 38.2 [g] at 0.007 [s]
Min: -5.1 [g] at -0.010 [s]

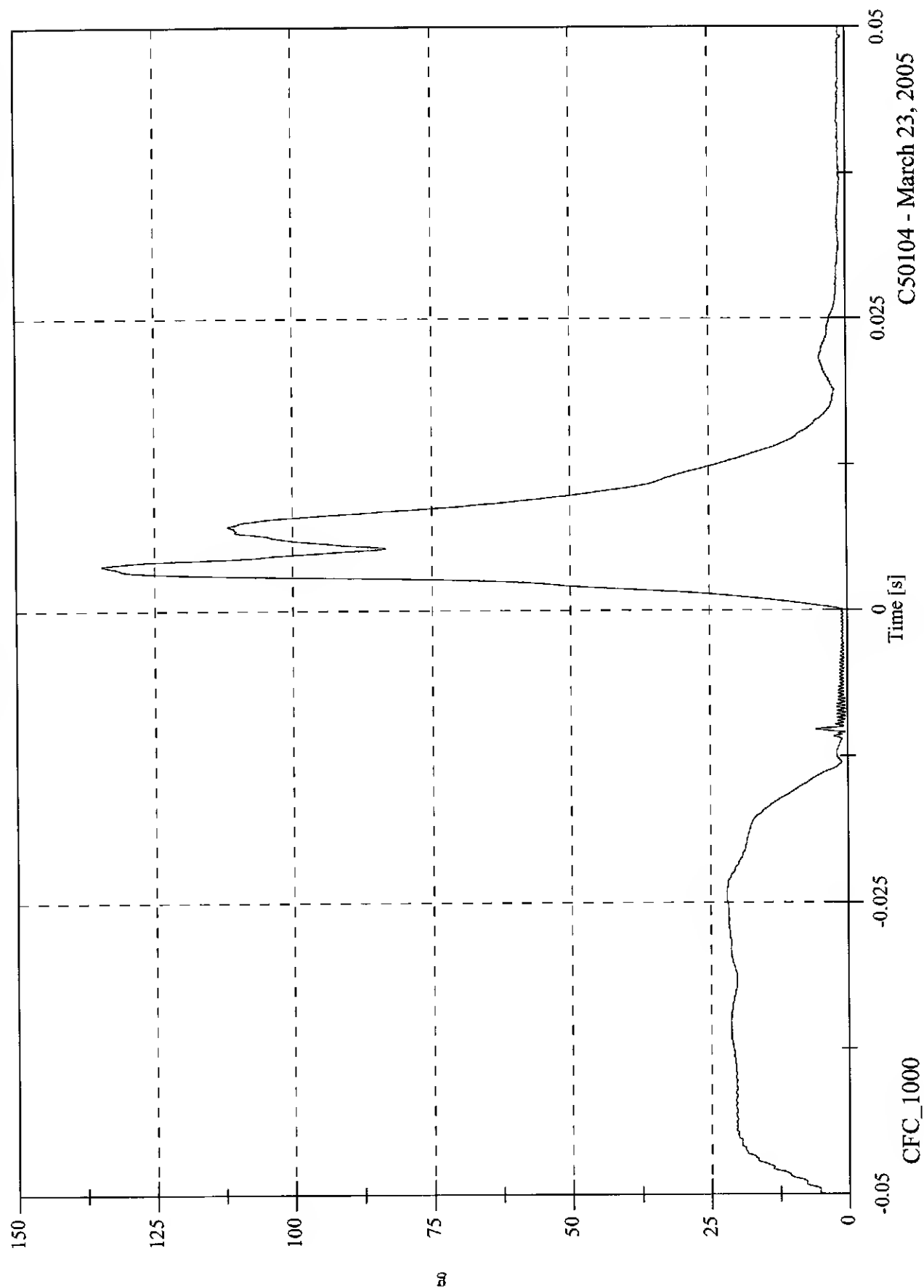


C50104 - March 23, 2005

Max: 134.5 [g] at 0.004 [s]
Min: 0.3 [g] at -0.008 [s]

Headform Resultant

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

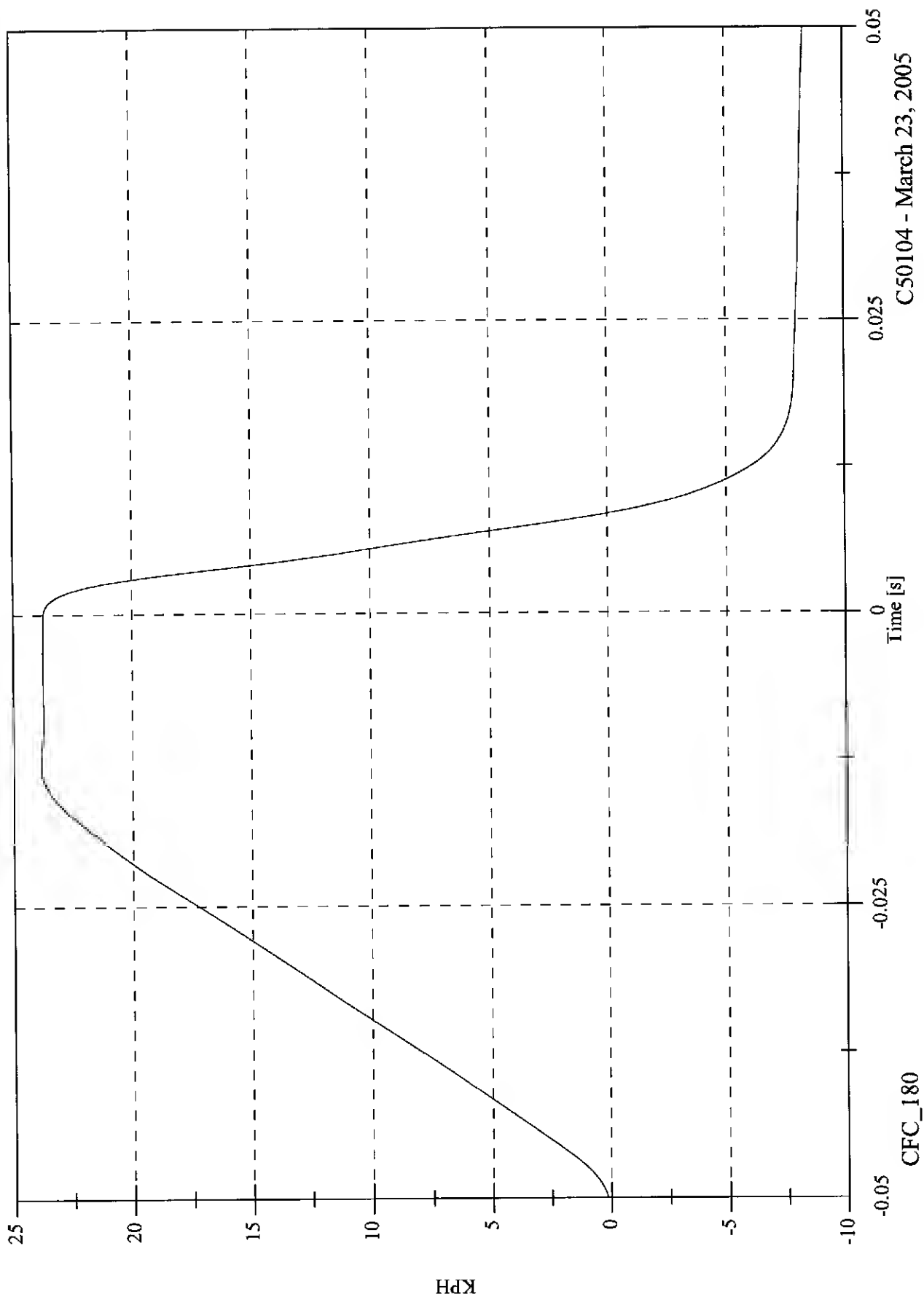


C50104 - March 23, 2005

Max: 23.9 [KPH] at -0.013 [s]
Min: -8.3 [KPH] at 0.050 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Velocity



C50104 - March 23, 2005



PRE-IMPACT BPI

8754-FMI-04



POST-IMPACT BPI

8754.FMH-04

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	06
Test Date:	03/23/05
Target Location:	A-Pillar
Target Code:	AP3
Horizontal Impact Angle:	125°
Vertical Impact Angle:	38°
Ambient Temperature:	24.5C°
Relative Humidity:	13.7
Time of Impact:	13:20
Headform Number:	62

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	6	<input checked="" type="checkbox"/> mm right	<input type="checkbox"/> mm left
On Centerline	20	mm up	



POST-IMPACT AP3 HEADFORM

Free Motion HIC	668.1
HIC(d)	664.9
Impact Velocity (kph)	23.89
HIC T1 (msec)	1.7
HIC T2 (msec)	7.2

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan C50104 - AP3

FMH Headform 0062

Location: AP3

Test Date: March 23, 2005

Work File: AP3

-----TEST RESULTS-----

Lab Temperature: 24.5 C

HICd: 668.1

Lab Humidity: 13.7 %

HIC (36ms): 664.9

Velocity at Impact: 23.89 KPH

t1: 1.7 msec

t2: 7.2 msec

Free Flight Distance: 216.85 mm

Duration: 5.5 msec

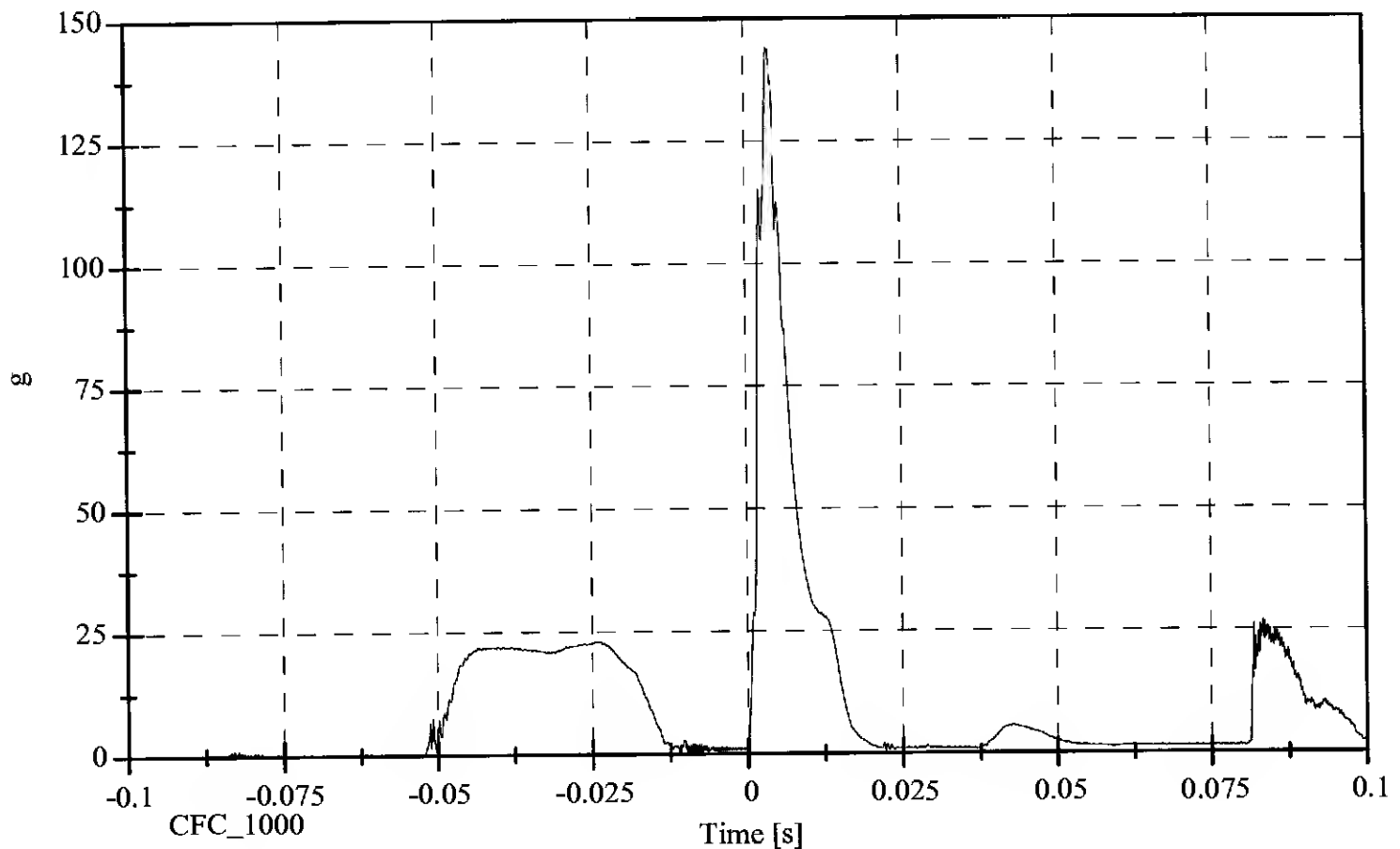
Maximum: 144.2 g

Average Acceleration: 10.0 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan
Headform Resultant

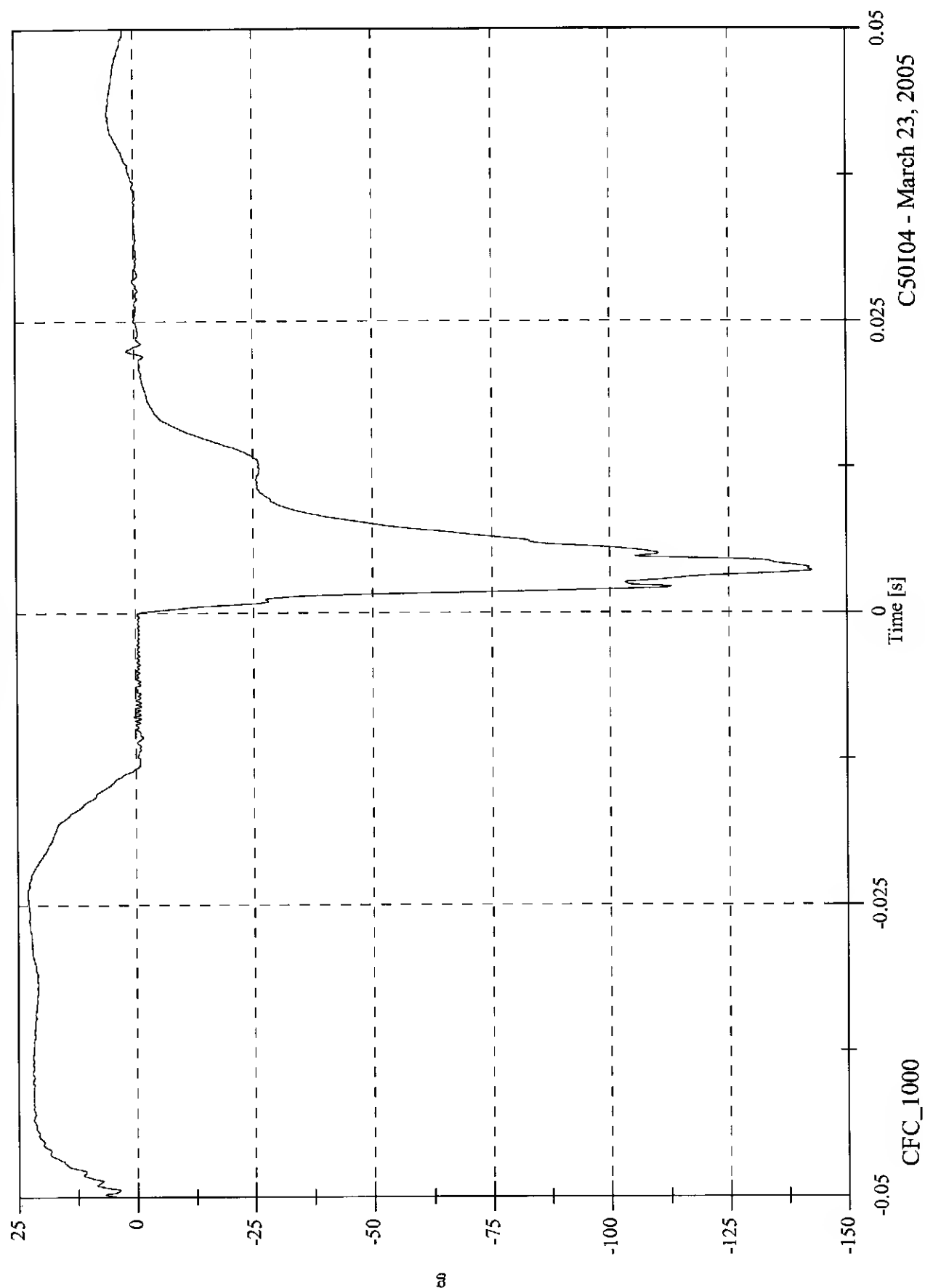
Max: 144.2 [g] at 0.004 [s]

Min: 0.0 [g] at -0.098 [s]



Max: 22.9 [g] at -0.024 [s]
Min: -142.6 [g] at 0.004 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan
Headform X Acceleration



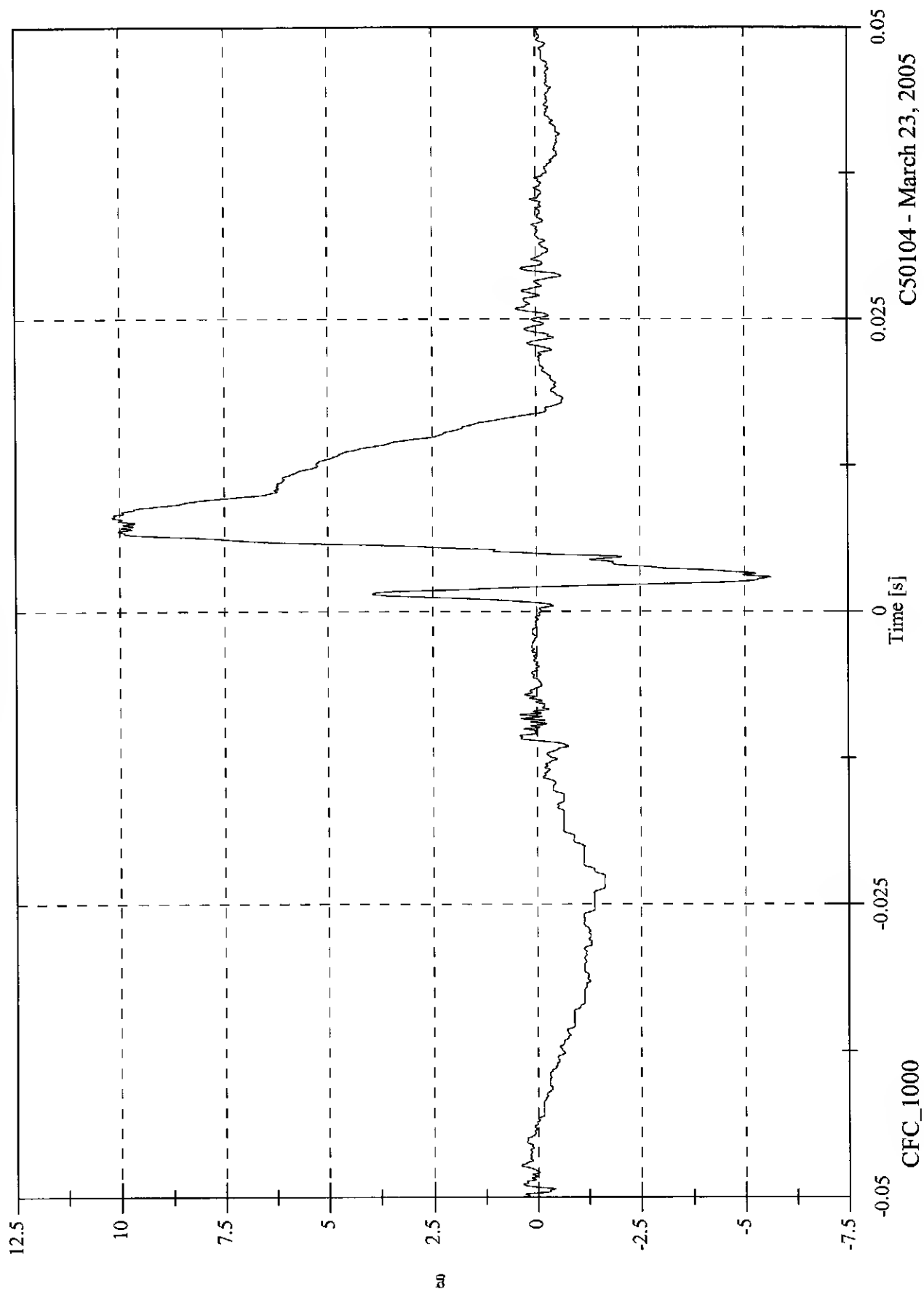
C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan

Headform Y Acceleration

Max: 10.2 [g] at 0.008 [s]

Min: -5.6 [g] at 0.003 [s]

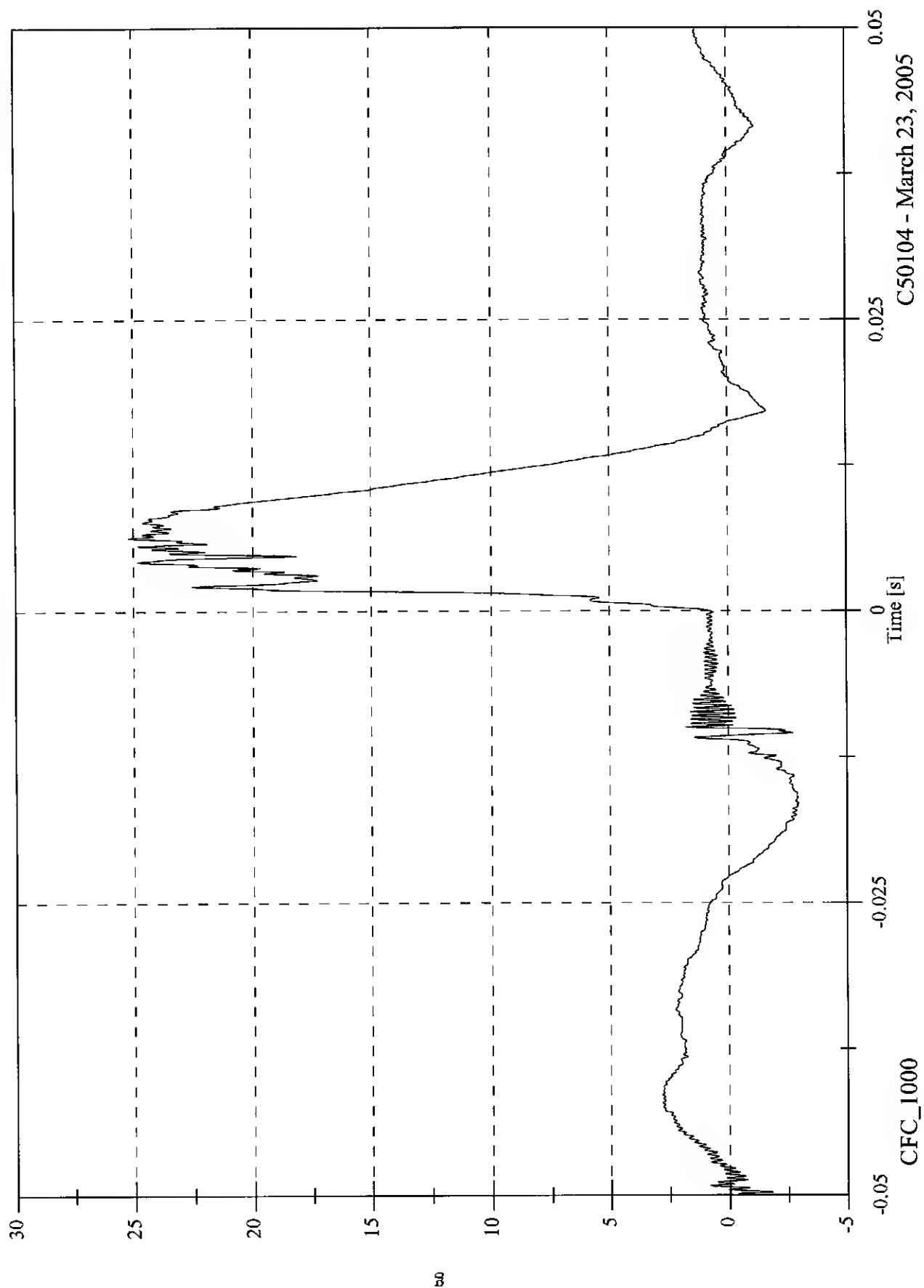


C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan

Headform Z Acceleration

Max: 25.2 [g] at 0.006 [s]
Min: -2.9 [g] at -0.016 [s]



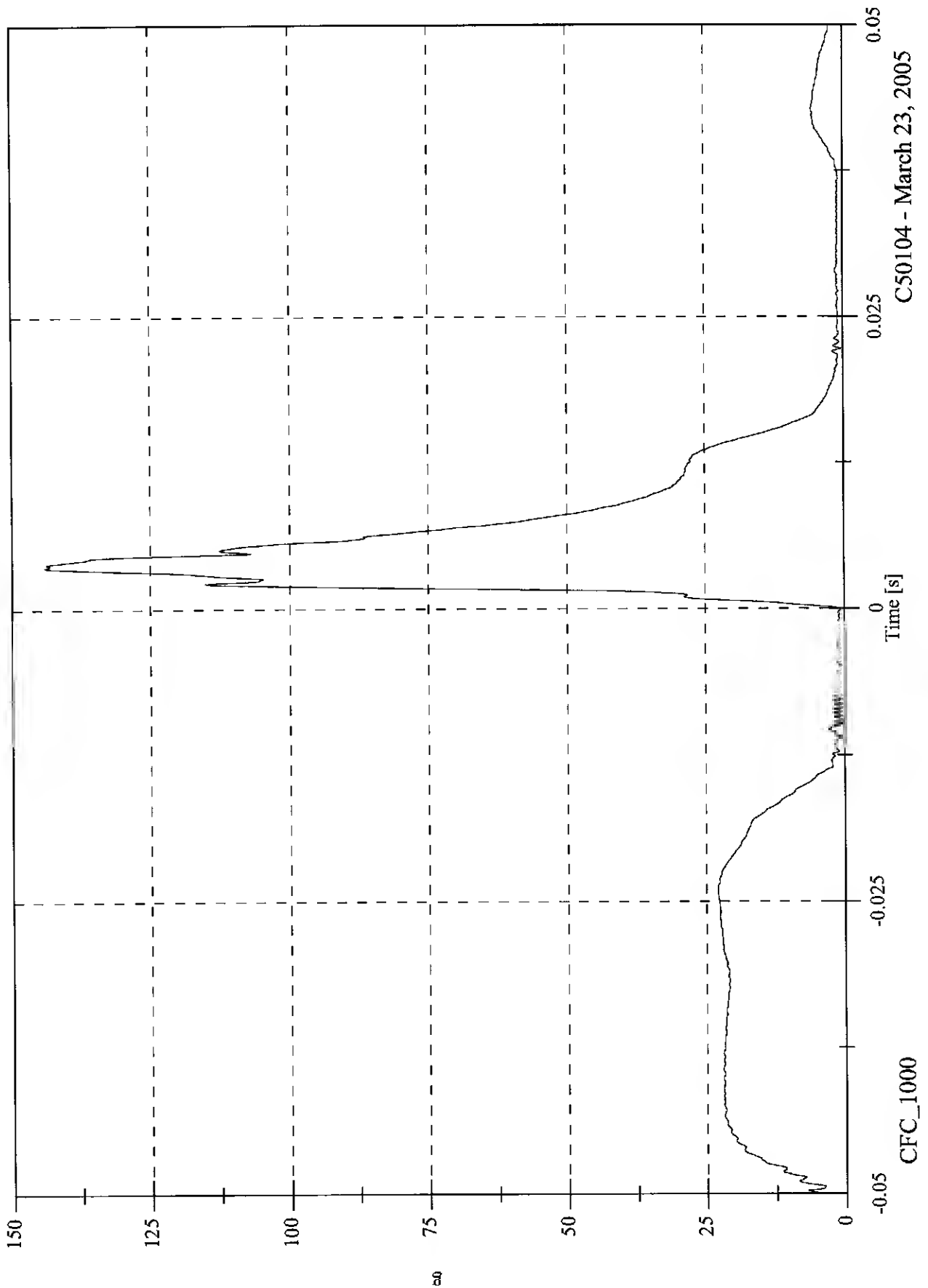
C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan

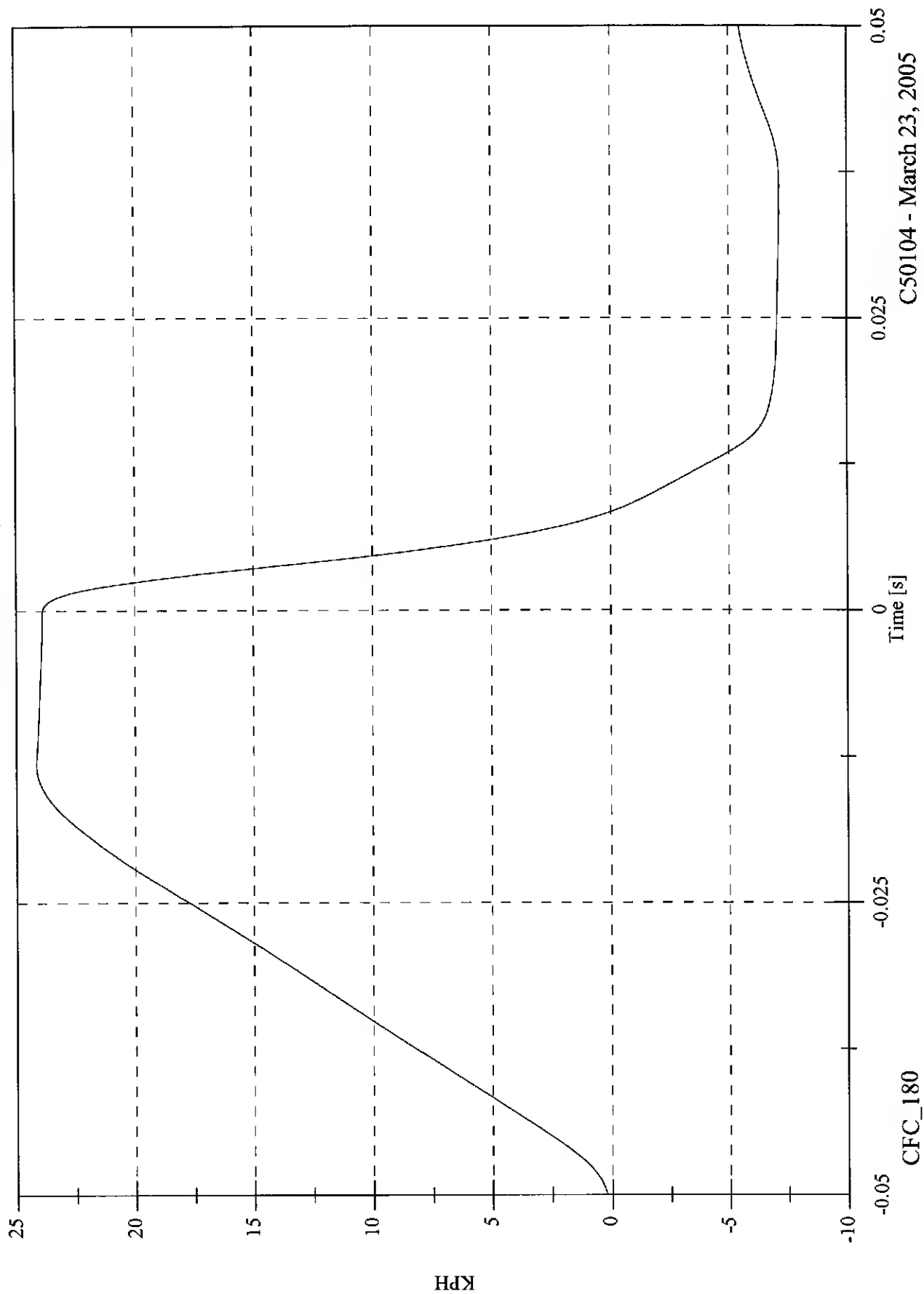
Headform Resultant

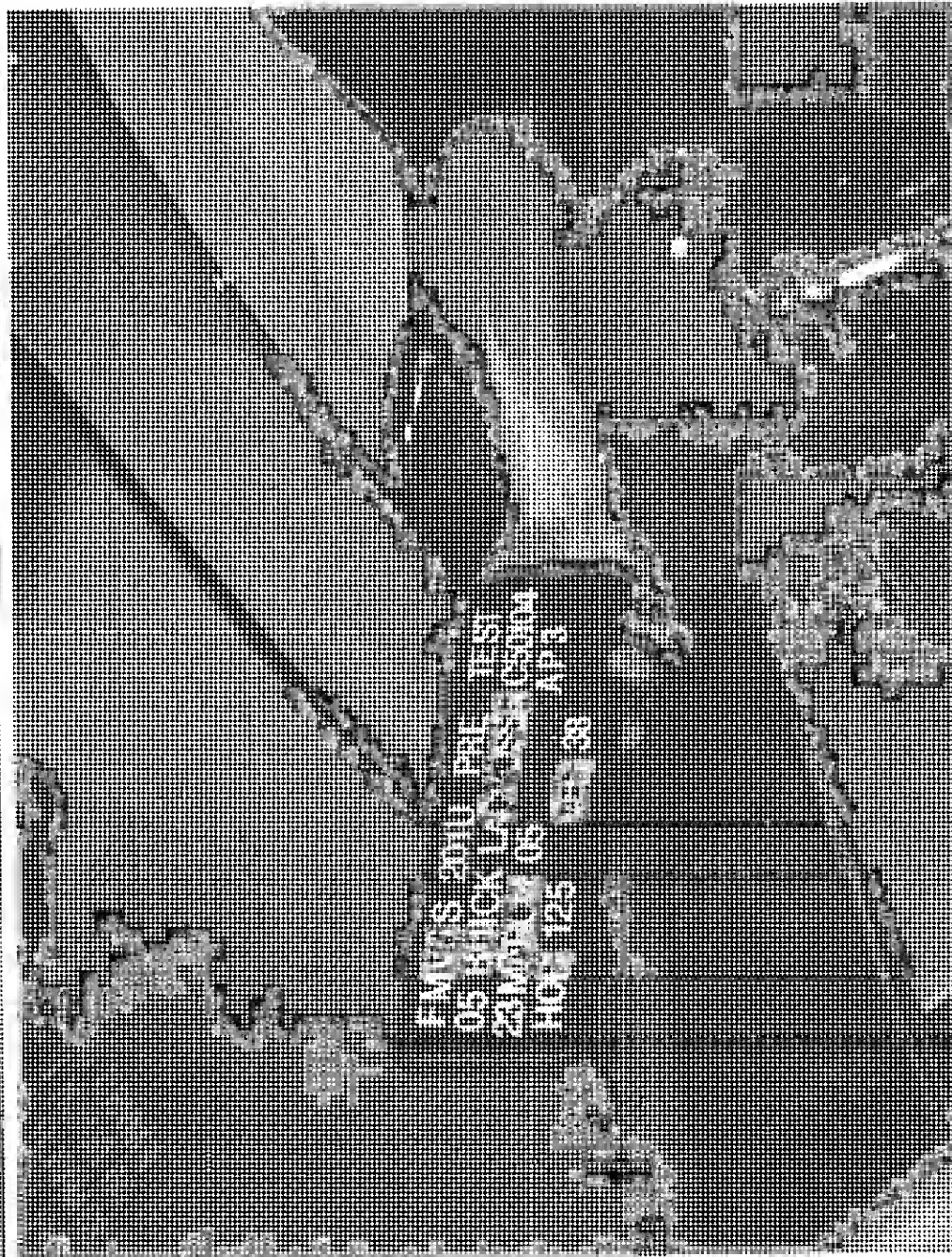
Max: 144.2 [g] at 0.004 [s]

Min: 0.1 [g] at -0.008 [s]



FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse Sedan
Headform Velocity
Max: 24.2 [KPH] at -0.013 [s]
Min: -7.2 [KPH] at 0.036 [s]

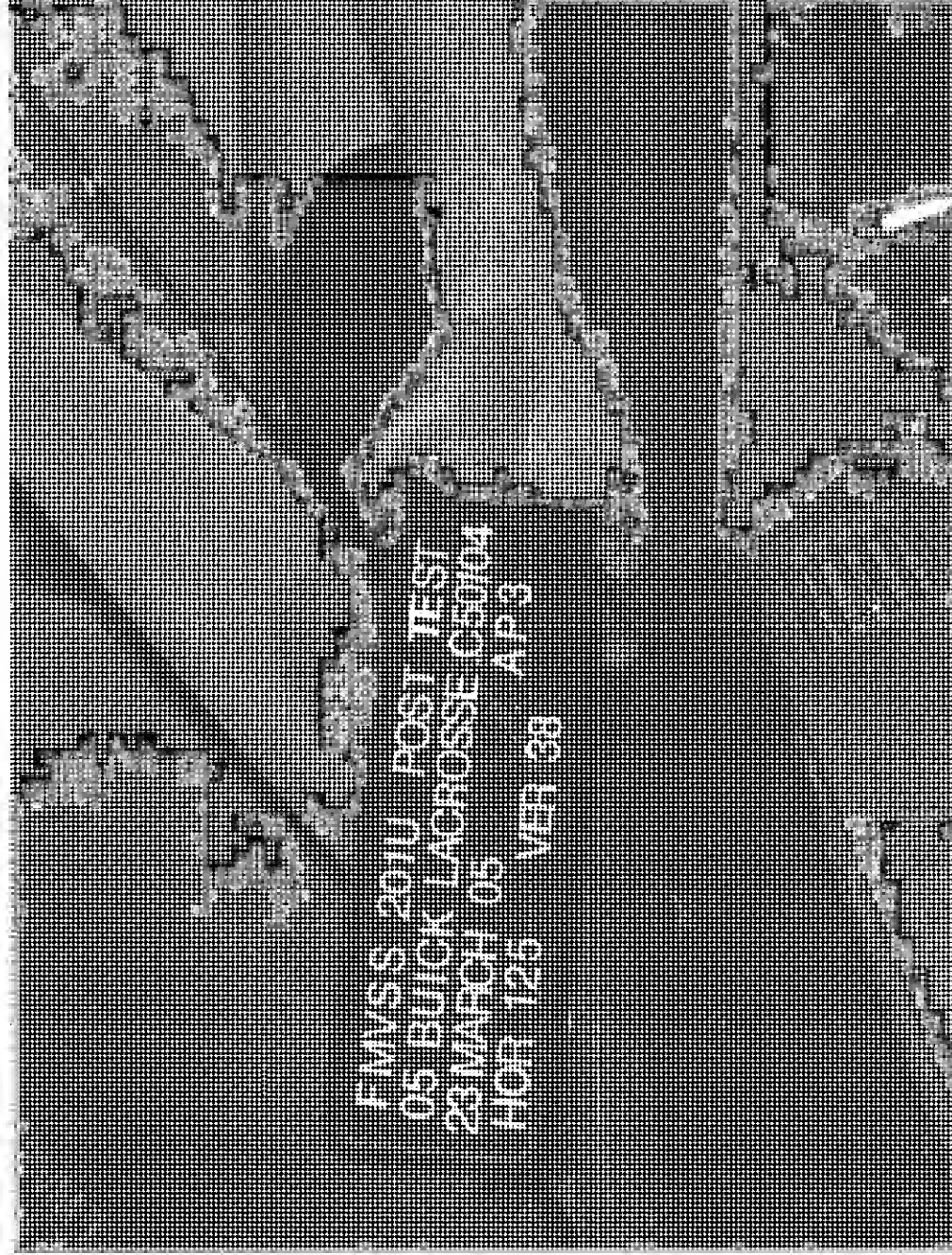




FMV's 2010 PRE TEST
05 HICK LANE
23 MAR 05
HCL 125
AP 3
DEC 38

PRE-IMPACT AP3

8754-FMH-04



POST-IMPACT AP3

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	07
Test Date:	03/23/05
Target Location:	A-Pillar
Target Code:	AP1
Horizontal Impact Angle:	132°
Vertical Impact Angle:	27°
Ambient Temperature:	24.6C°
Relative Humidity:	14.6
Time of Impact:	13:55
Headform Number:	355

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	35	<input checked="" type="checkbox"/>	mm right	<input type="checkbox"/> mm left
On Centerline	28		mm up	



POST-IMPACT AP1 HEADFORM

Free Motion HIC	641.7
HIC(d)	650.5
Impact Velocity (kph)	23.46
HIC T1 (msec)	2.3
HIC T2 (msec)	7.7

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - AP1

FMH Headform 0355

Location: AP1

Test Date: March 23, 2005

Work File: AP1

-----TEST RESULTS-----

Lab Temperature: 24.6 C

HICd: 650.5

Lab Humidity: 14.6 %

HIC (36ms): 641.7

Velocity at Impact: 23.46 KPH

t1: 2.3 msec

t2: 7.7 msec

Free Flight Distance: 220.93 mm

Duration: 5.4 msec

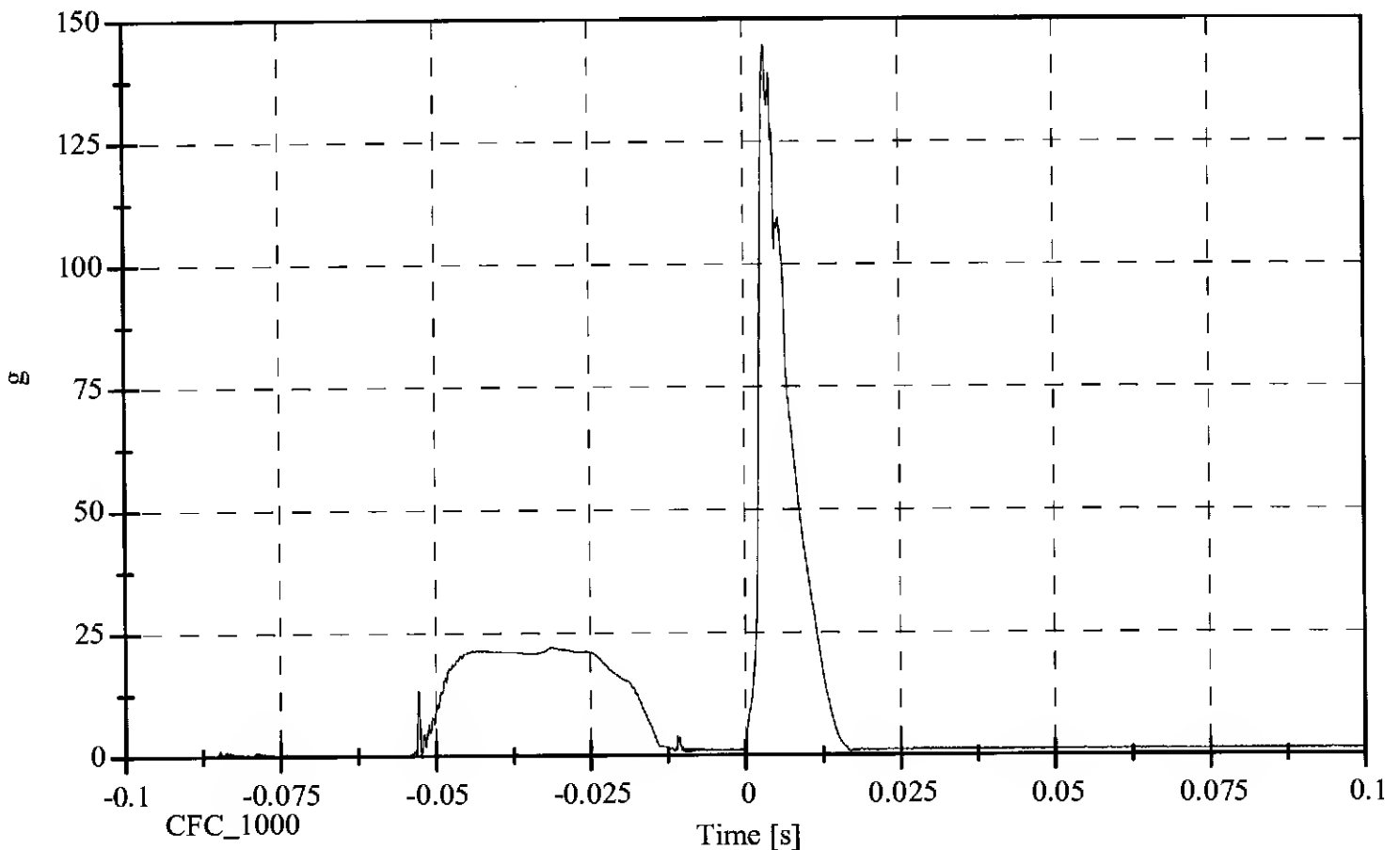
Maximum: 144.8 g

Average Acceleration: 8.2 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Resultant

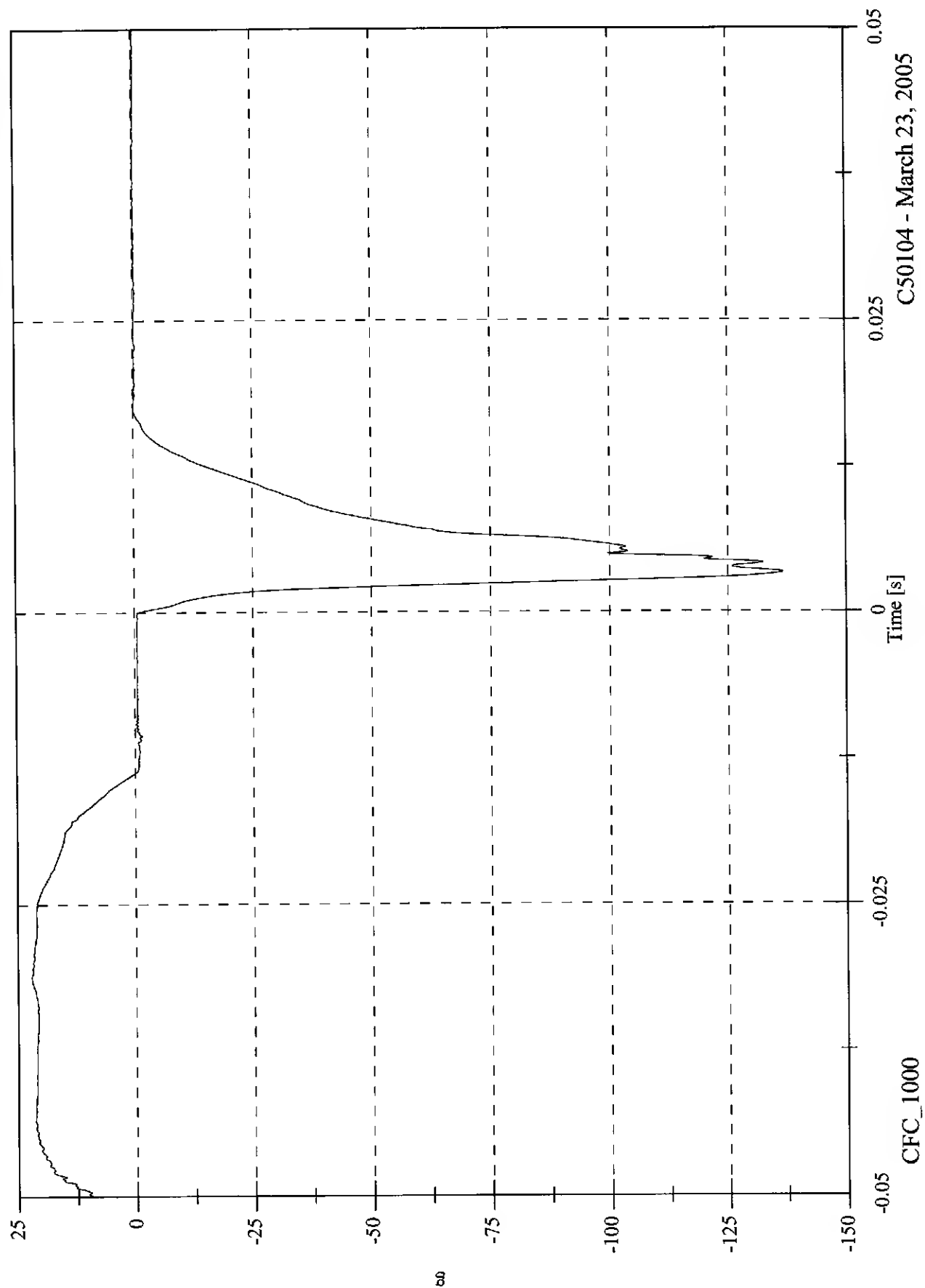
Max: 144.8 [g] at 0.003 [s]

Min: 0.0 [g] at -0.067 [s]



FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform X Acceleration

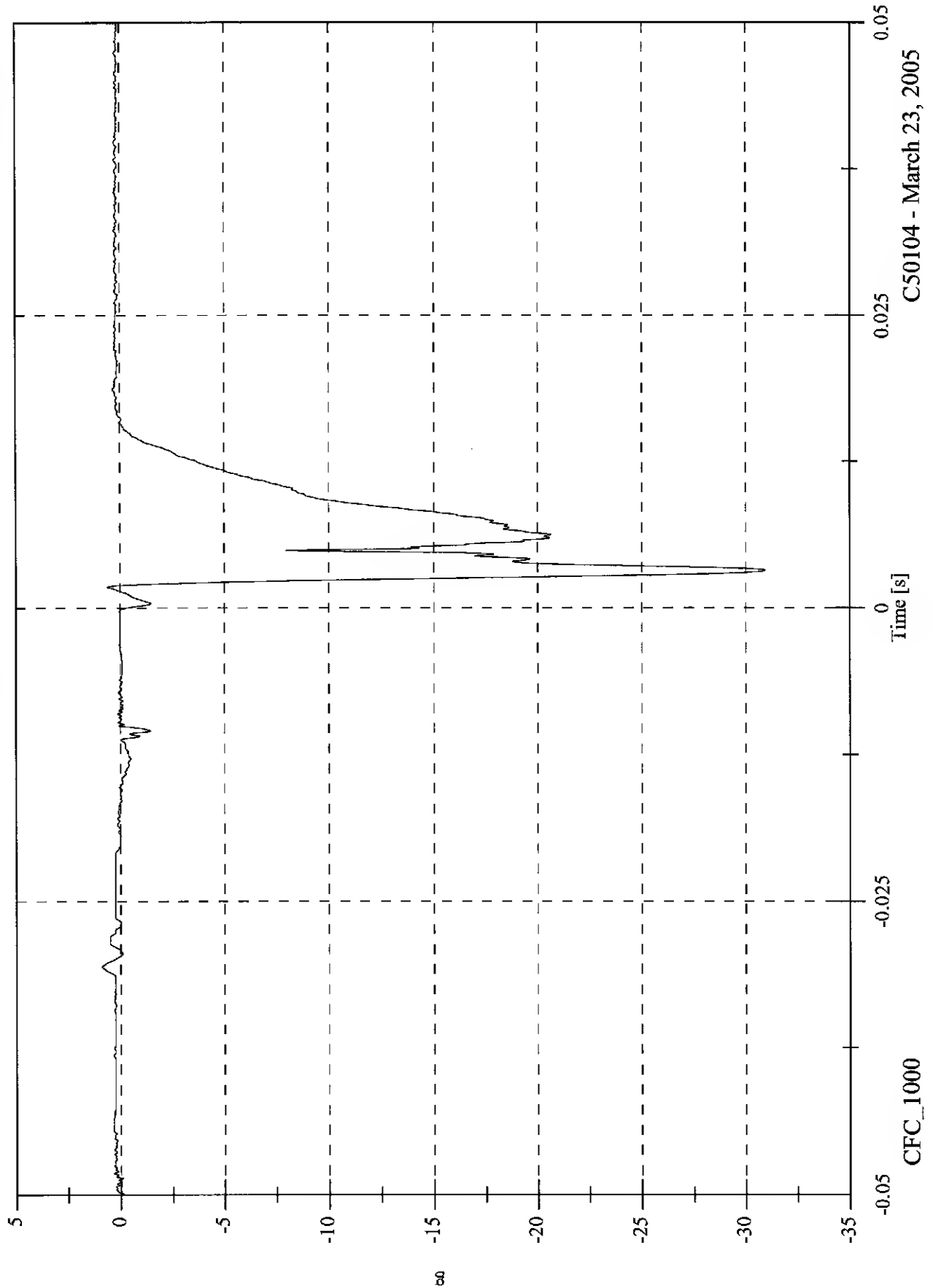
Max: 22.1 [g] at -0.031 [s]
Min: -136.8 [g] at 0.003 [s]



FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Y Acceleration

Max: 0.9 [g] at -0.031 [s]
Min: -30.9 [g] at 0.003 [s]



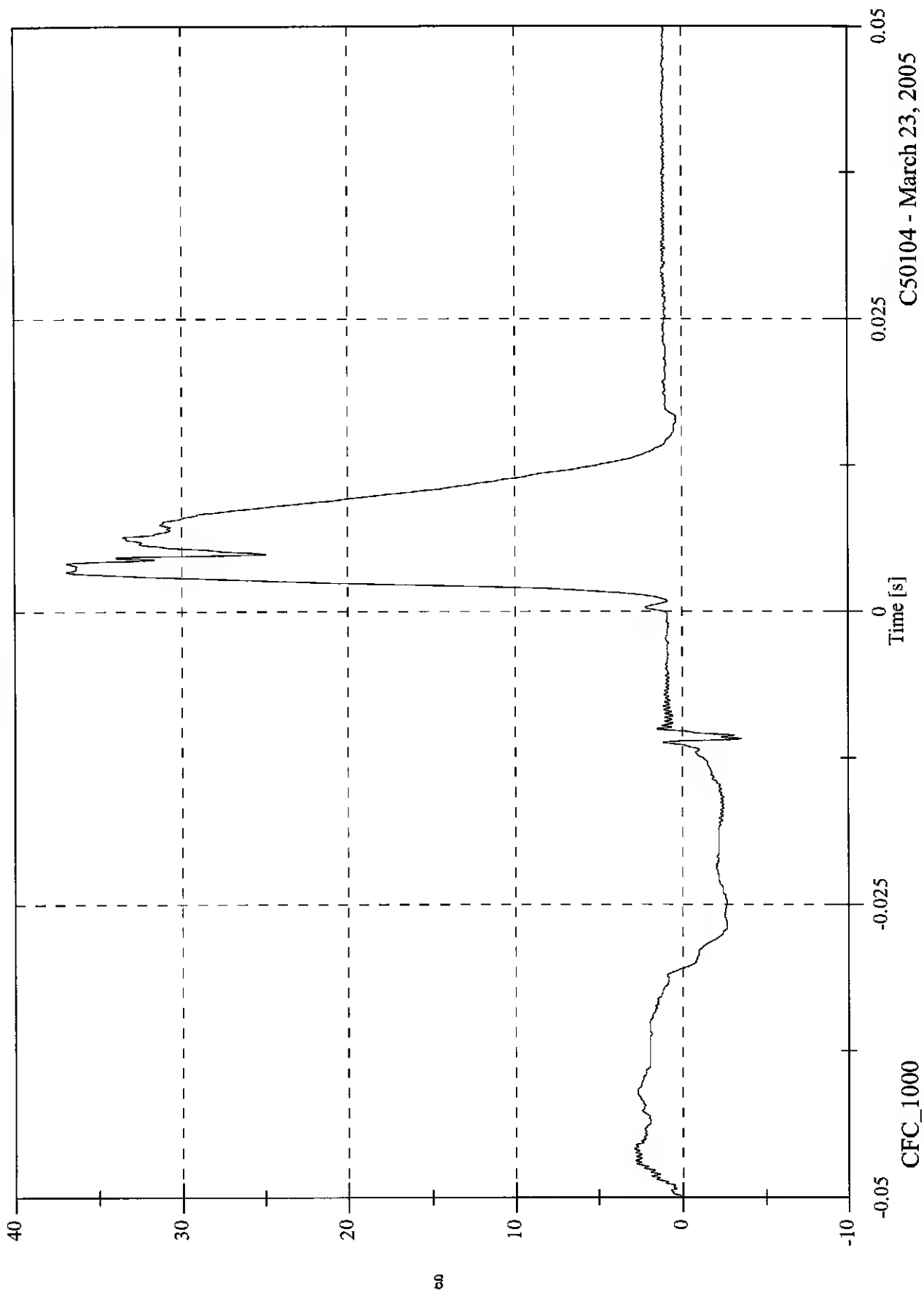
C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Z Acceleration

Max: 36.9 [g] at 0.003 [s]

Min: -3.5 [g] at -0.011 [s]

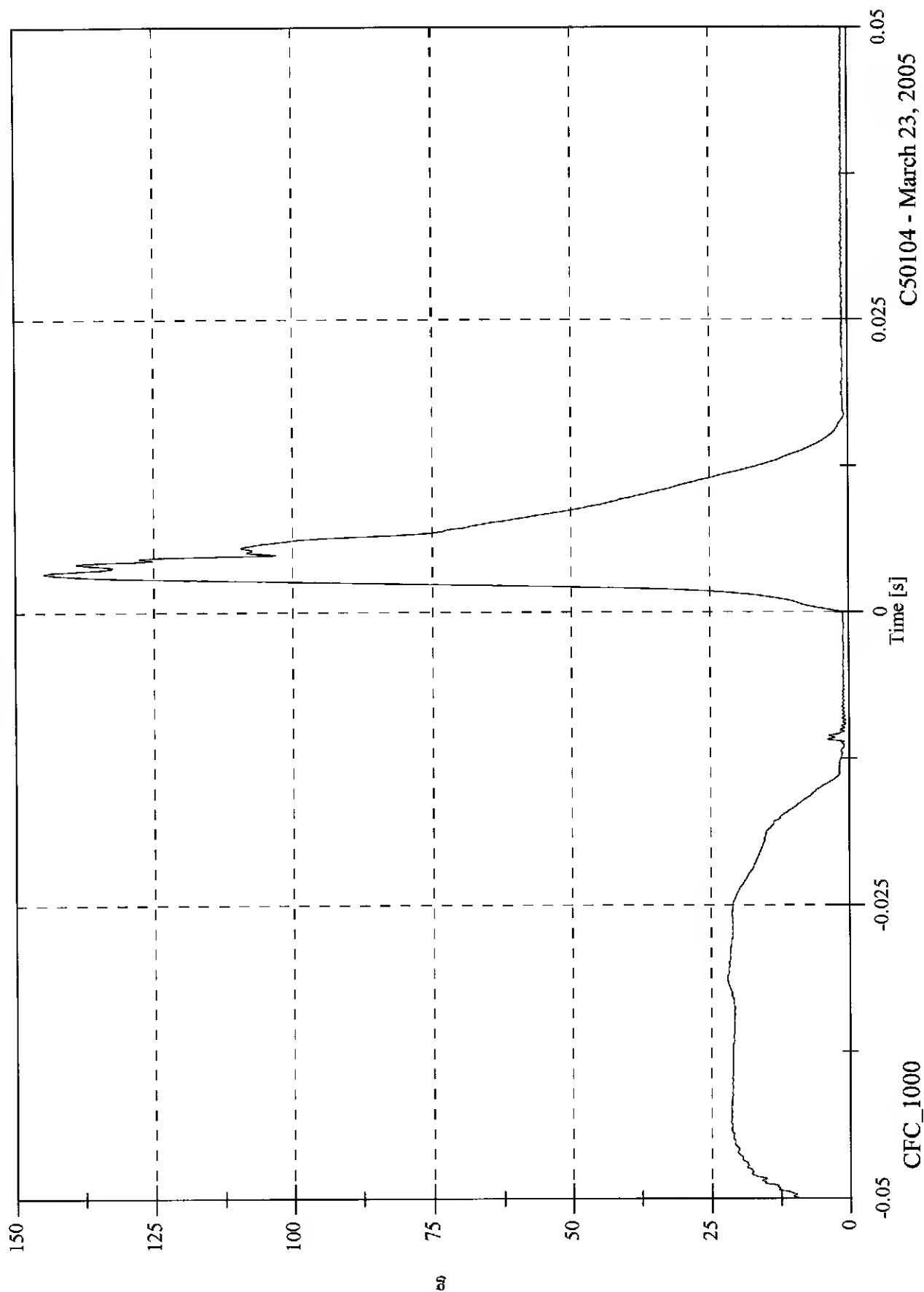


C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Resultant

Max: 144.8 [g] at 0.003 [s]
Min: 0.6 [g] at -0.010 [s]

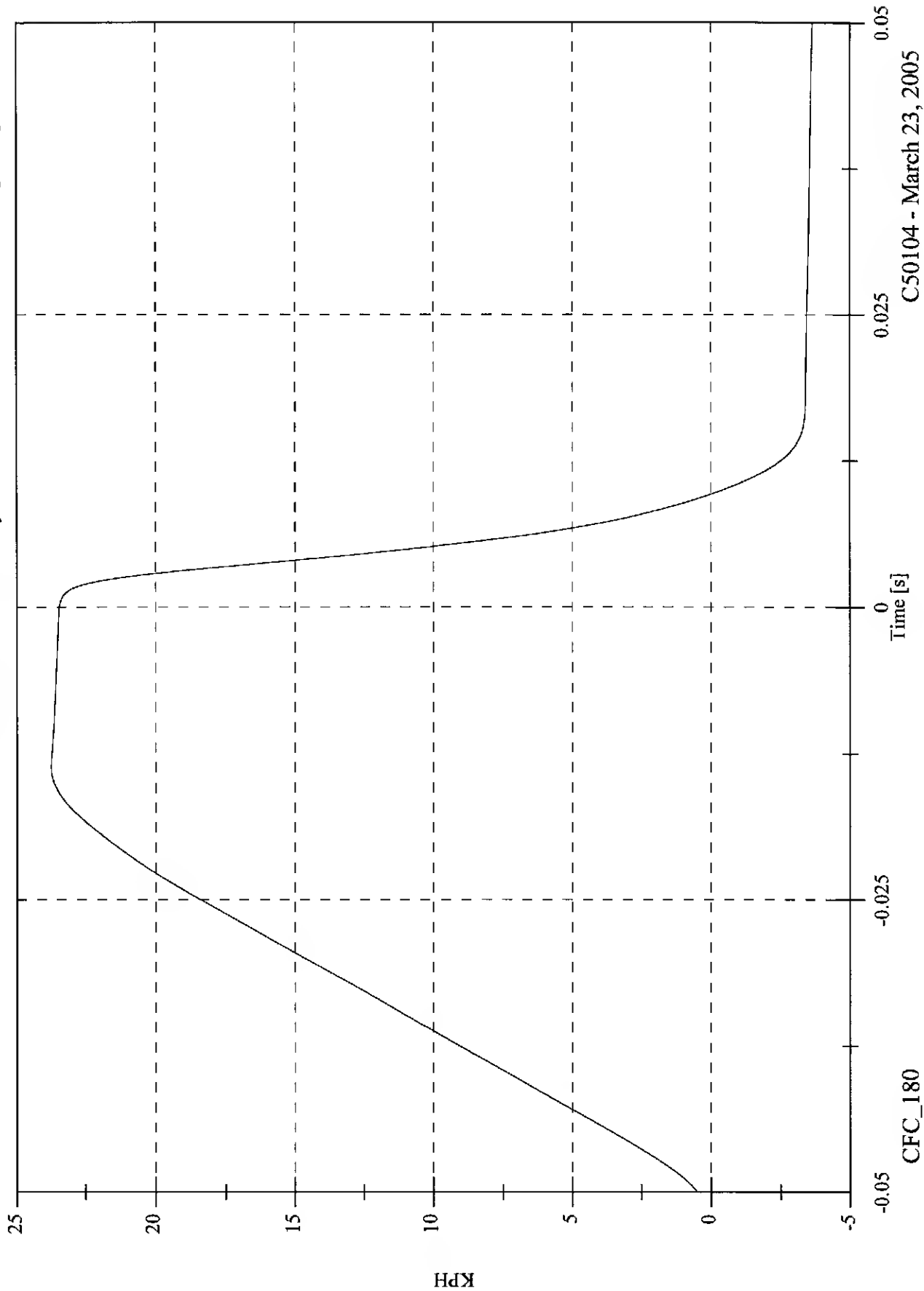


C50104 - March 23, 2005

Max: 23.8 [KPH] at -0.014 [s]
Min: -3.6 [KPH] at 0.050 [s]

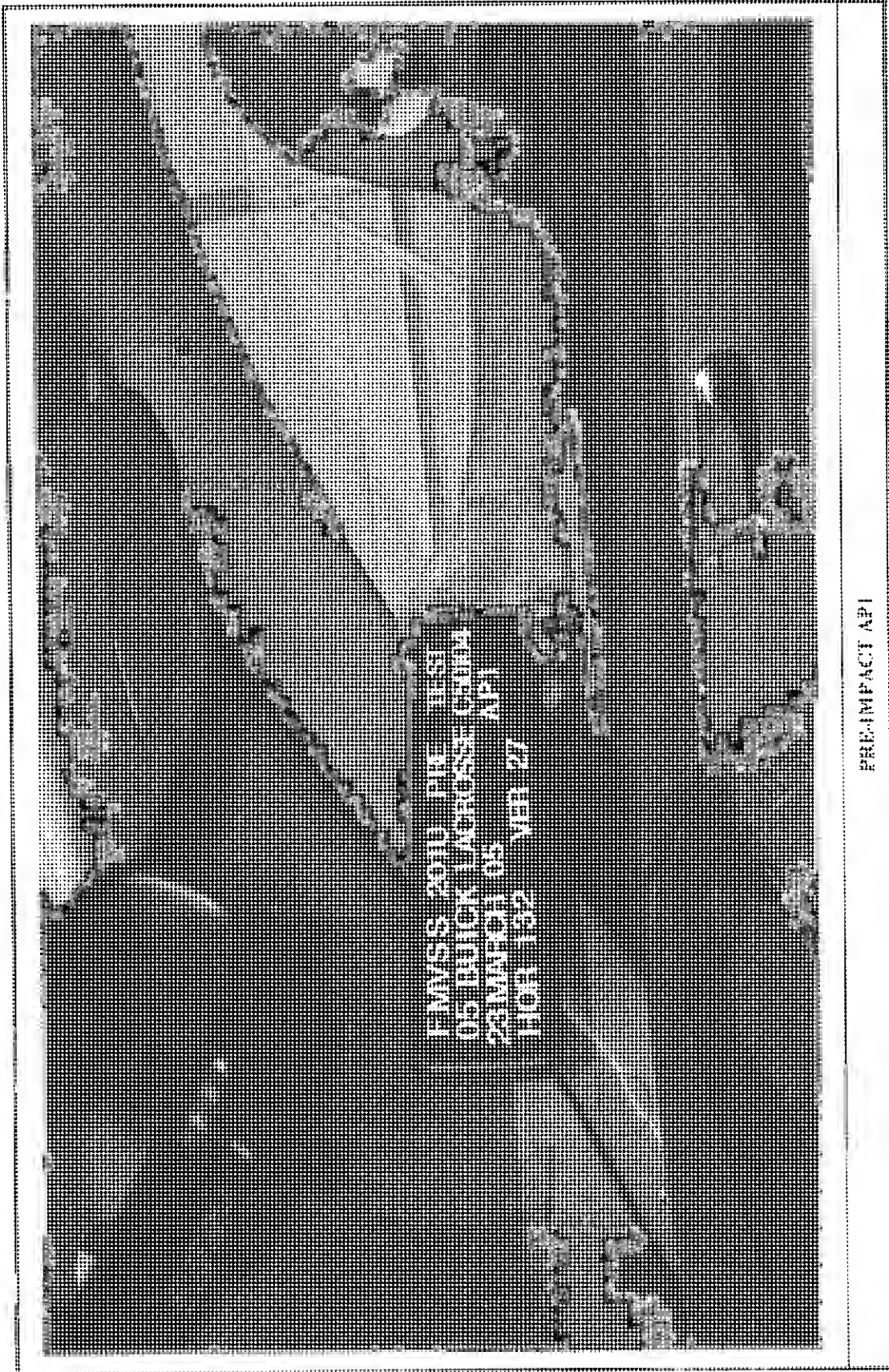
FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Velocity



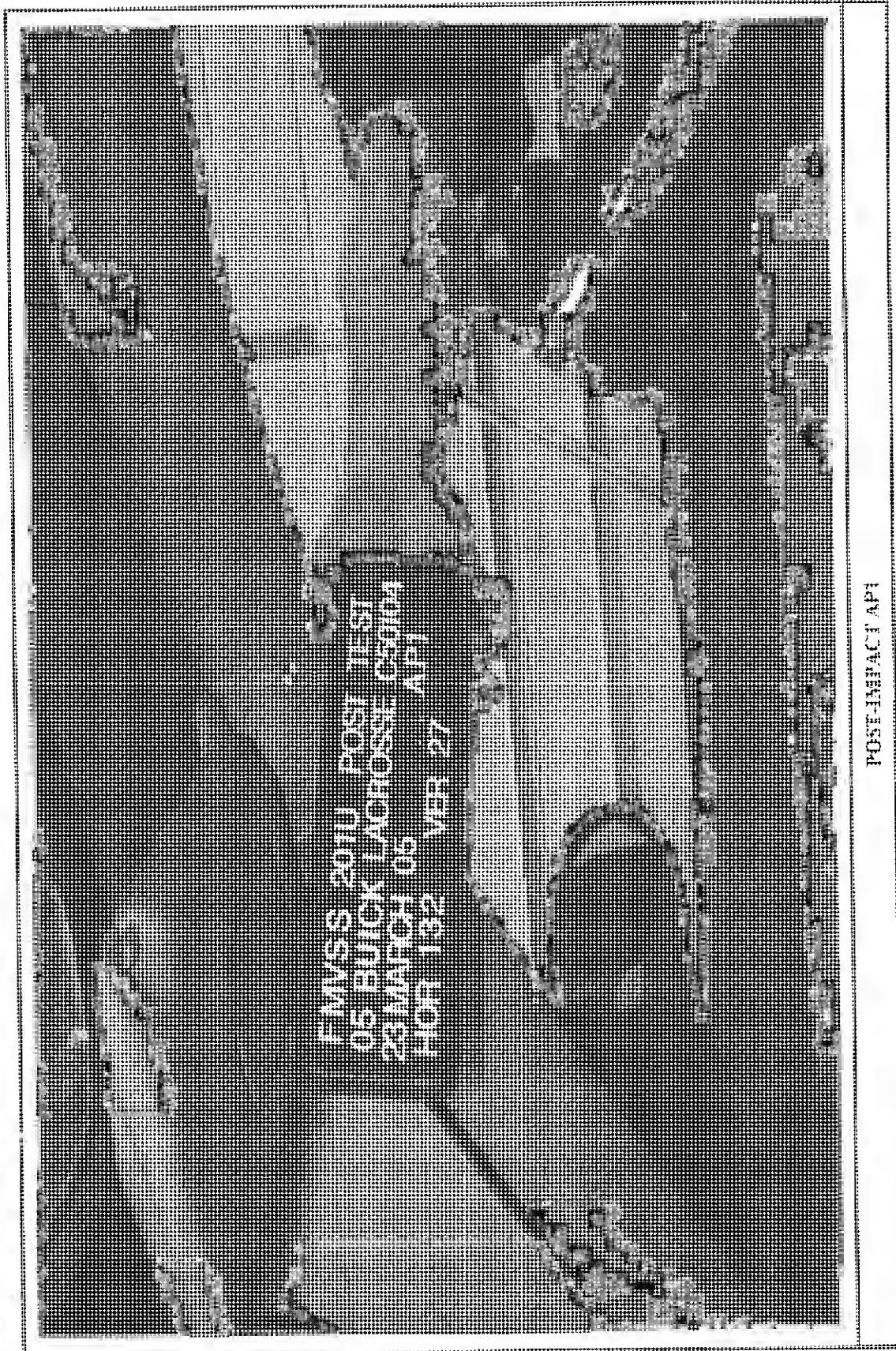
CFC_180

C50104 - March 23, 2005



PRE-IMPACT API

8754-FM11-04



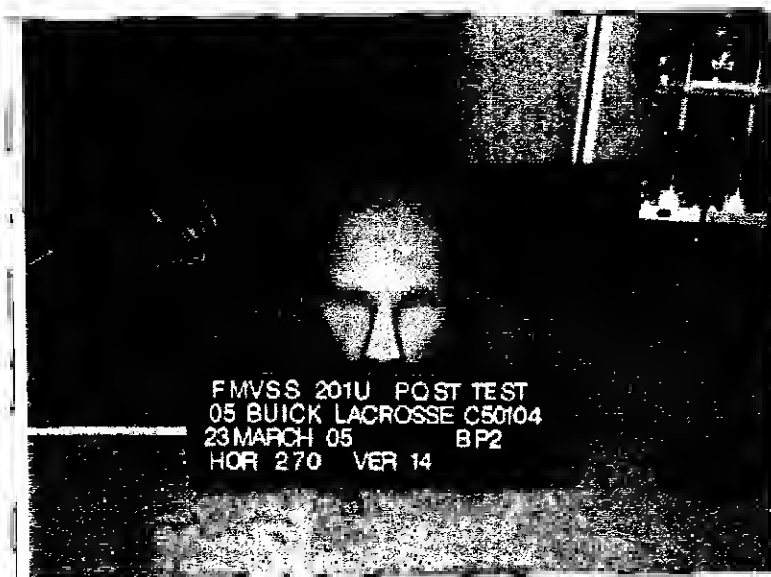
POST-IMPACT API

8754-FVH-04

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	08
Test Date:	03/23/05
Target Location:	B-Pillar
Target Code:	BP2
Horizontal Impact Angle:	270°
Vertical Impact Angle:	14°
Ambient Temperature:	24.6C°
Relative Humidity:	16.7
Time of Impact:	15:30
Headform Number:	805

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	17	mm right	x mm left
On Centerline	12	mm up	



POST-IMPACT BP2 HEADFORM

Free Motion HIC	933.9
HIC(d)	871.0
Impact Velocity (kph)	23.83
HIC T1 (msec)	1.9
HIC T2 (msec)	7.4

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - BP2

FMH Headform 805

Location: BP2

Test Date: March 23, 2005

Work File: BP2

-----TEST RESULTS-----

Lab Temperature: 24.6 C

HICd: 871.0

Lab Humidity: 16.7 %

HIC (36ms): 933.9

Velocity at Impact: 23.84 KPH

t1: 1.9 msec

t2: 7.4 msec

Free Flight Distance: 214.95 mm

Duration: 5.5 msec

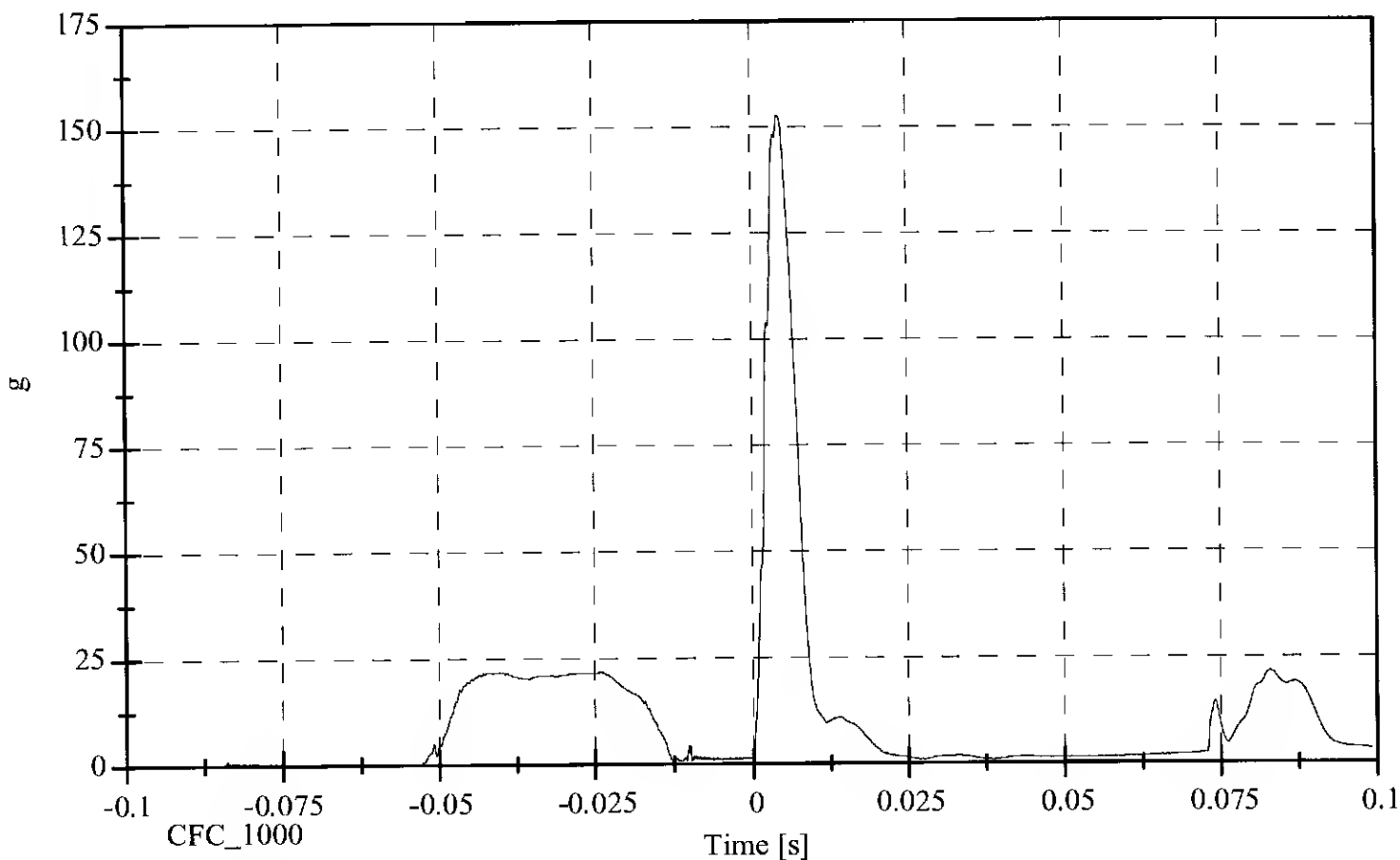
Maximum: 152.8 g

Average Acceleration: 10.0 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Resultant

Max: 152.8 [g] at 0.004 [s]

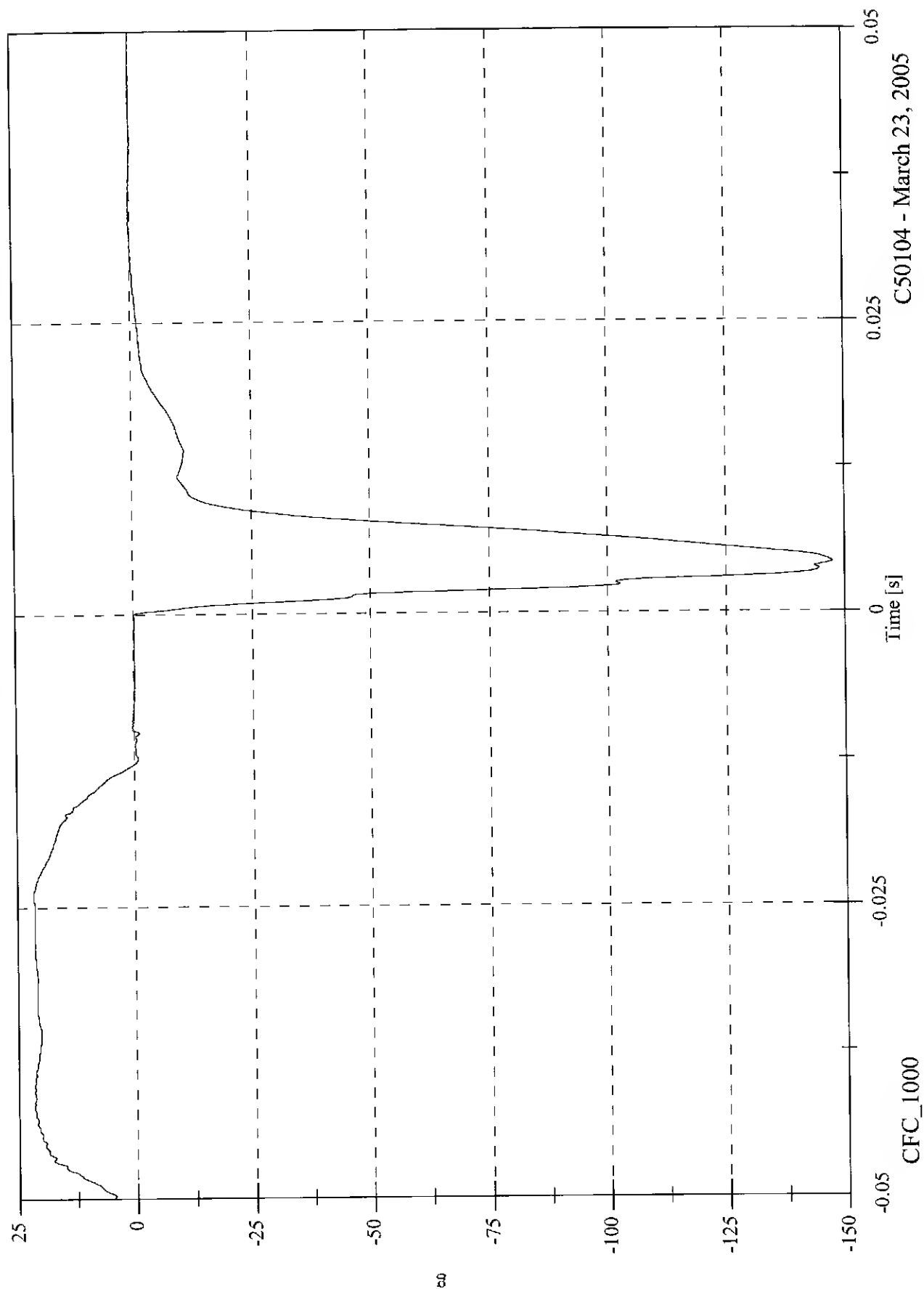
Min: 0.0 [g] at -0.088 [s]



Max: 21.6 [g] at -0.042 [s]
Min: -147.3 [g] at 0.004 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

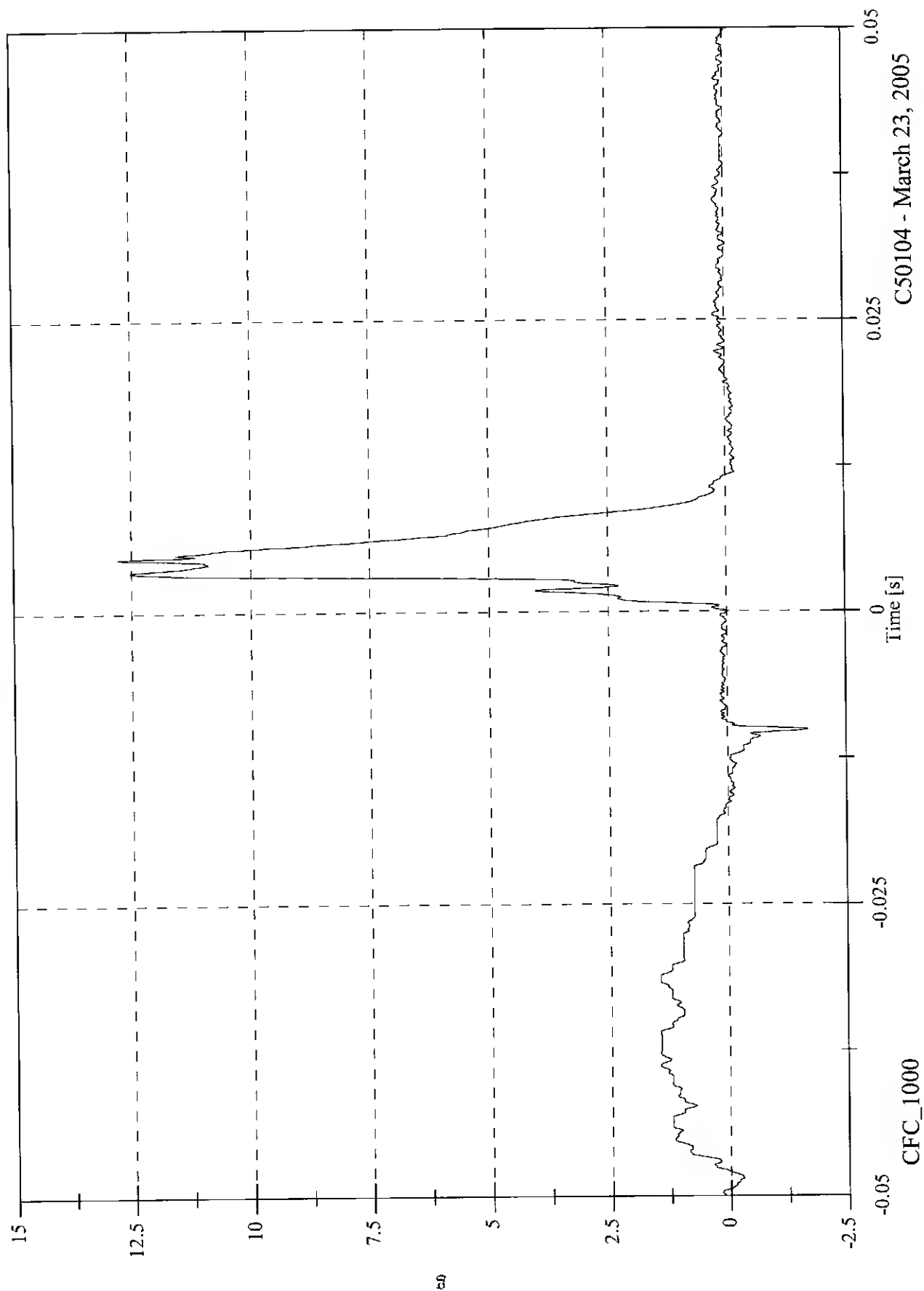
Headform X Acceleration



C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Y Acceleration

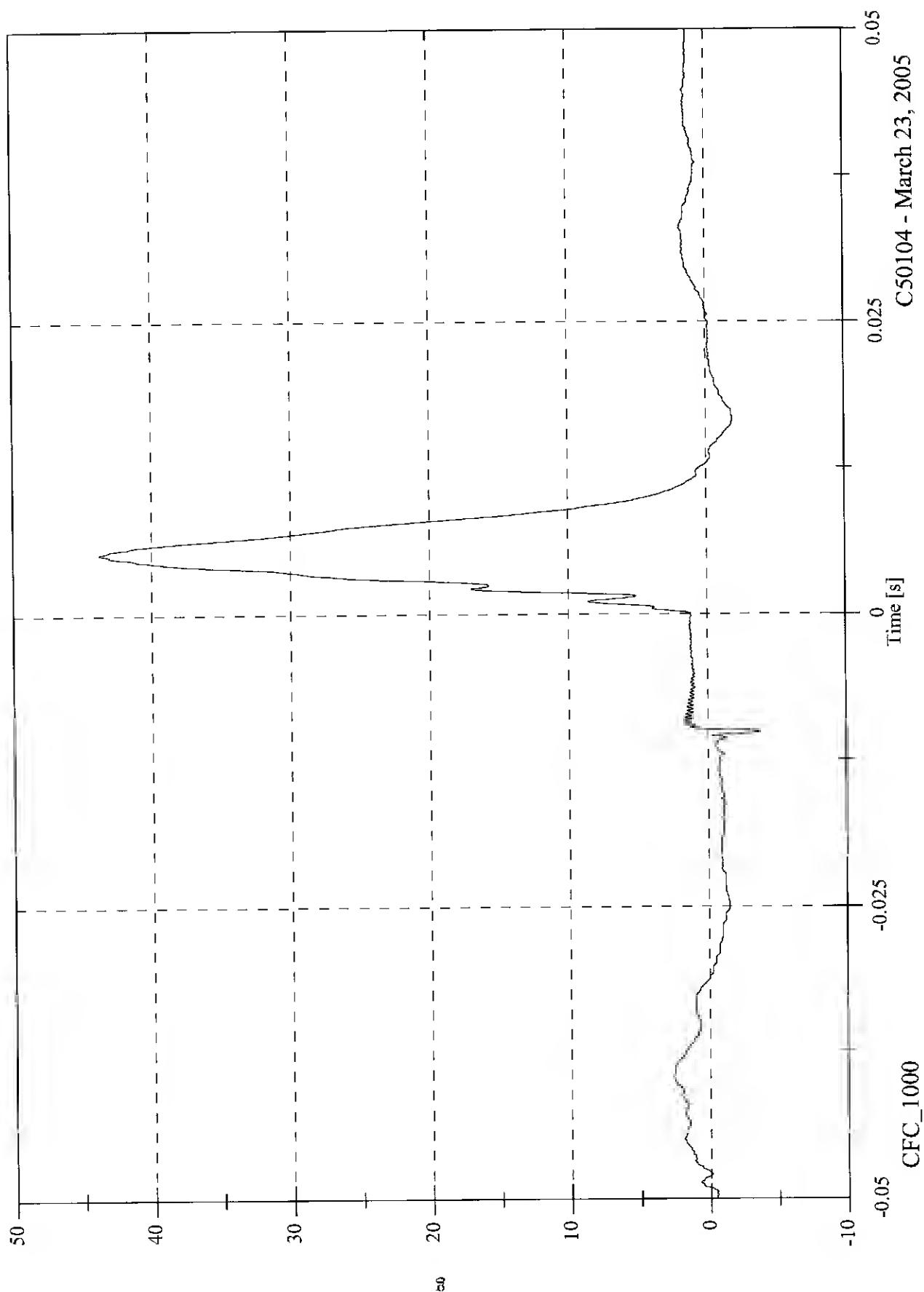
Max: 12.8 [g] at 0.005 [s]
Min: -1.7 [g] at -0.010 [s]



C50104 - March 23, 2005

Max: 43.8 [g] at 0.005 [s]
Min: -3.8 [g] at -0.010 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Z Acceleration

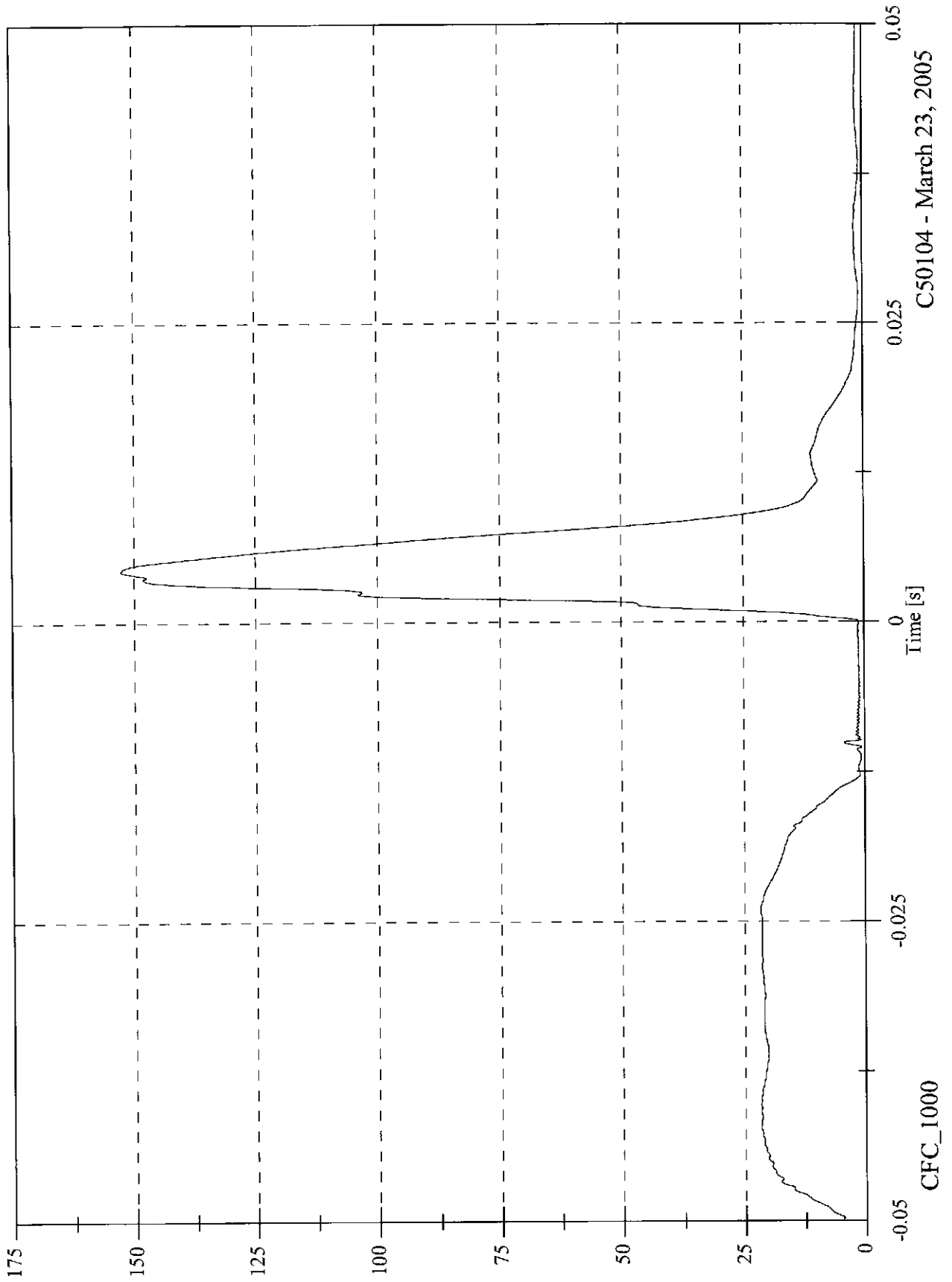


C50104 - March 23, 2005

Max: 152.8 [g] at 0.004 [s]
Min: 0.6 [g] at -0.010 [s]

Headform Resultant

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

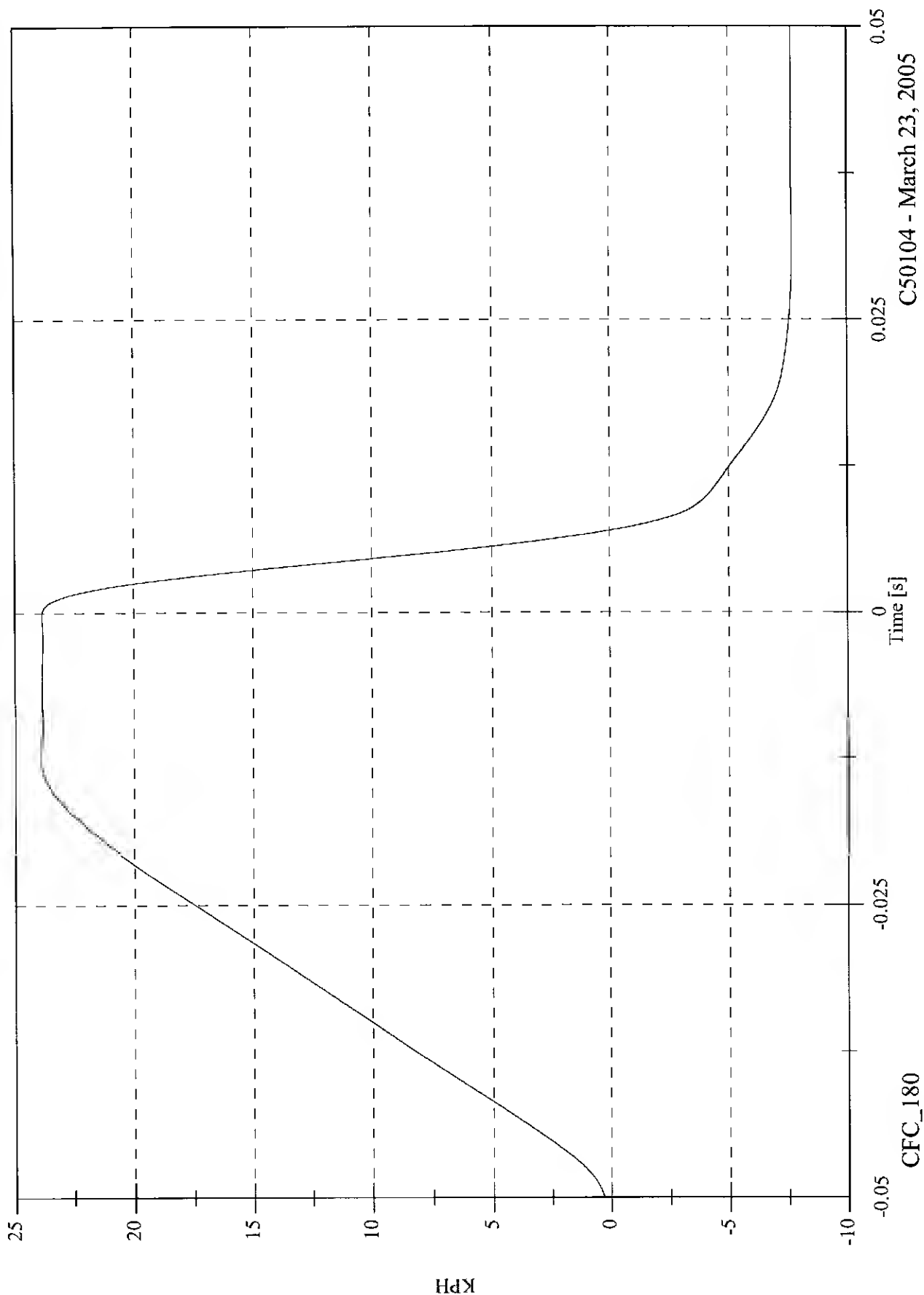


C50104 - March 23, 2005

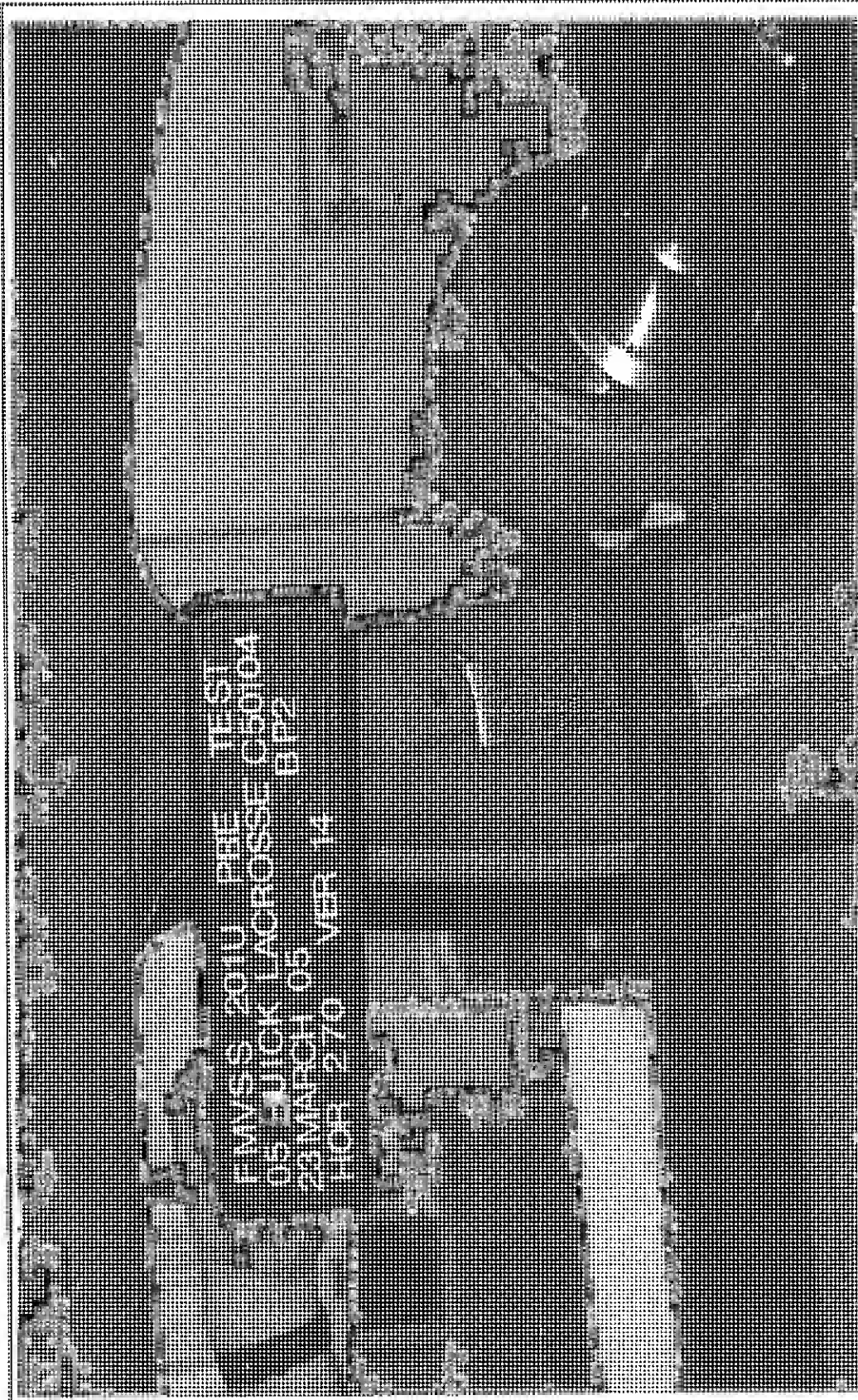
Max: 23.9 [KPH] at -0.013 [s]
Min: -7.7 [KPH] at 0.032 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Velocity



C50104 - March 23, 2005



FMVSS 201U PRE TEST
05 BUICK LACROSSE C500DA
BP2
23MARCH 05
FICH 270 VER 14

PRE-IMPACT BP2

8754.FMH-06



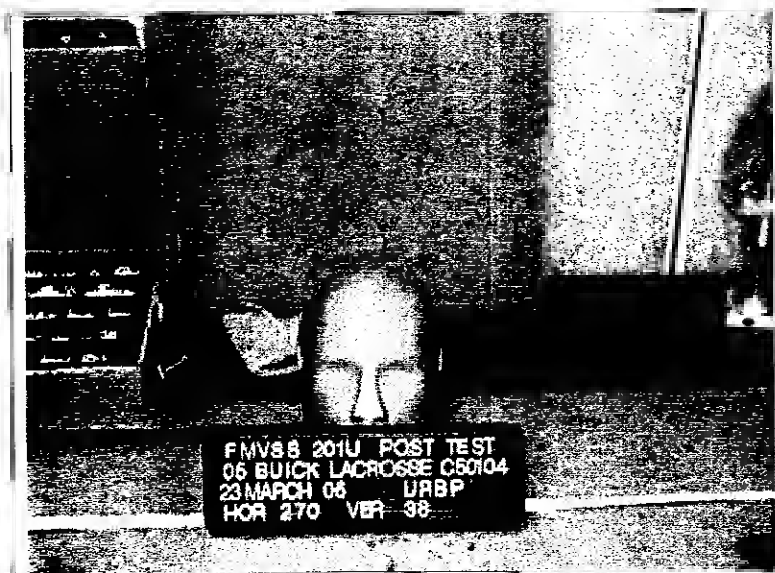
POST-IMPACT BPI

8754-FMH-04

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	09
Test Date:	03/23/05
Target Location:	Upper Roof
Target Code:	URBP
Horizontal Impact Angle:	270°
Vertical Impact Angle:	38°
Ambient Temperature:	24.4C°
Relative Humidity:	17
Time of Impact:	16:15
Headform Number:	1255

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	15	mm right	x mm left
On Centerline	58	mm up	



POST-IMPACT URBP HEADFORM

Free Motion HIC	t233.1
HIC(d)	1096.7
Impact Velocity (kph)	23.6
HIC T1 (msec)	3.1
HIC T2 (msec)	7.7

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - URBP

FMH Headform 1255

Location: URBP

Test Date: March 23, 2005

Work File: URBP

-----TEST RESULTS-----

Lab Temperature: 24.4 C

HICd: 1096.7

Lab Humidity: 17.0 %

HIC (36ms): 1233.1

Velocity at Impact: 23.60 KPH

t1: 3.1 msec

t2: 7.7 msec

Free Flight Distance: 218.66 mm

Duration: 4.6 msec

Maximum: 191.9 g

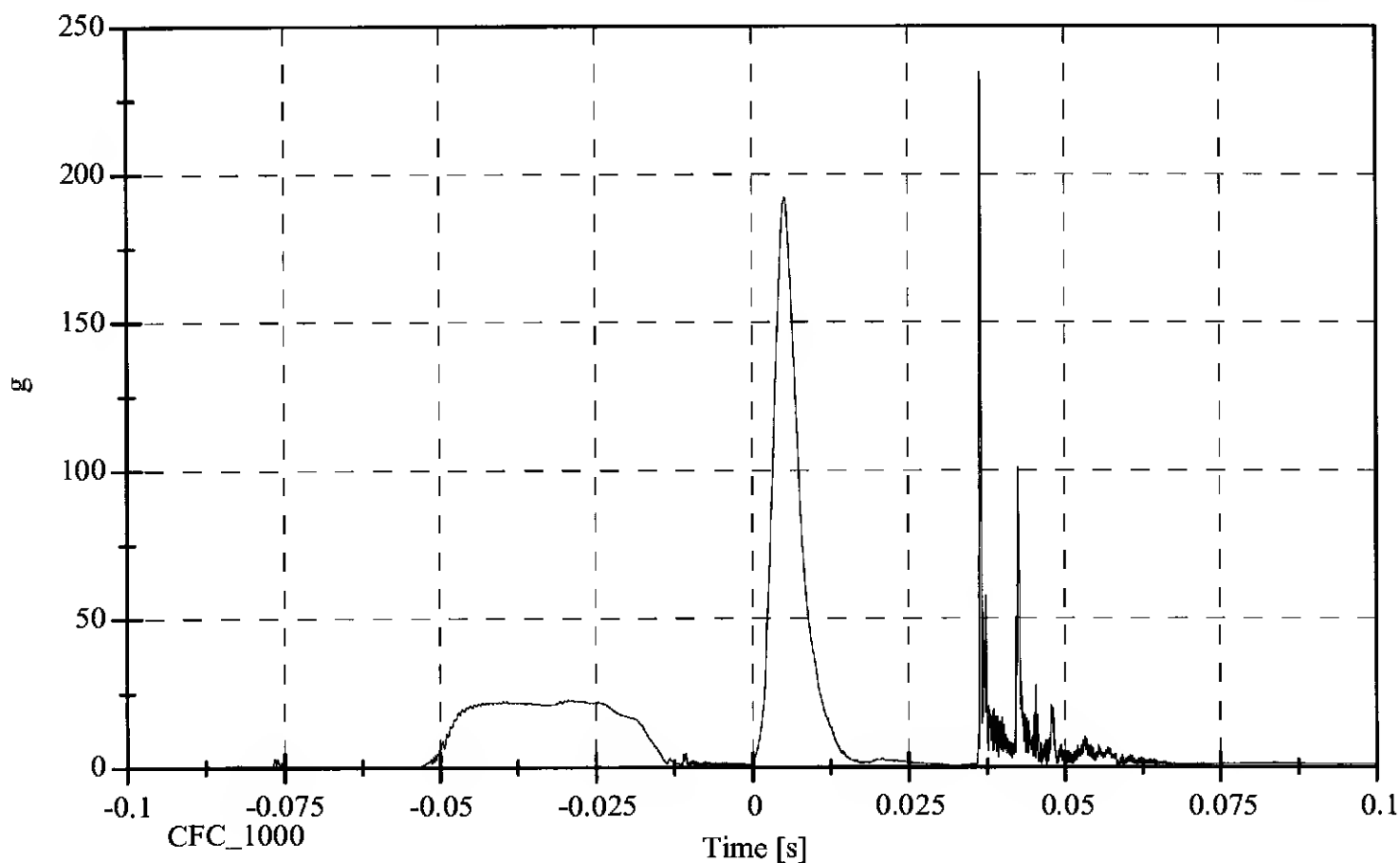
Average Acceleration: 10.3 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Max: 191.9 [g] at 0.005 [s]

Headform Resultant

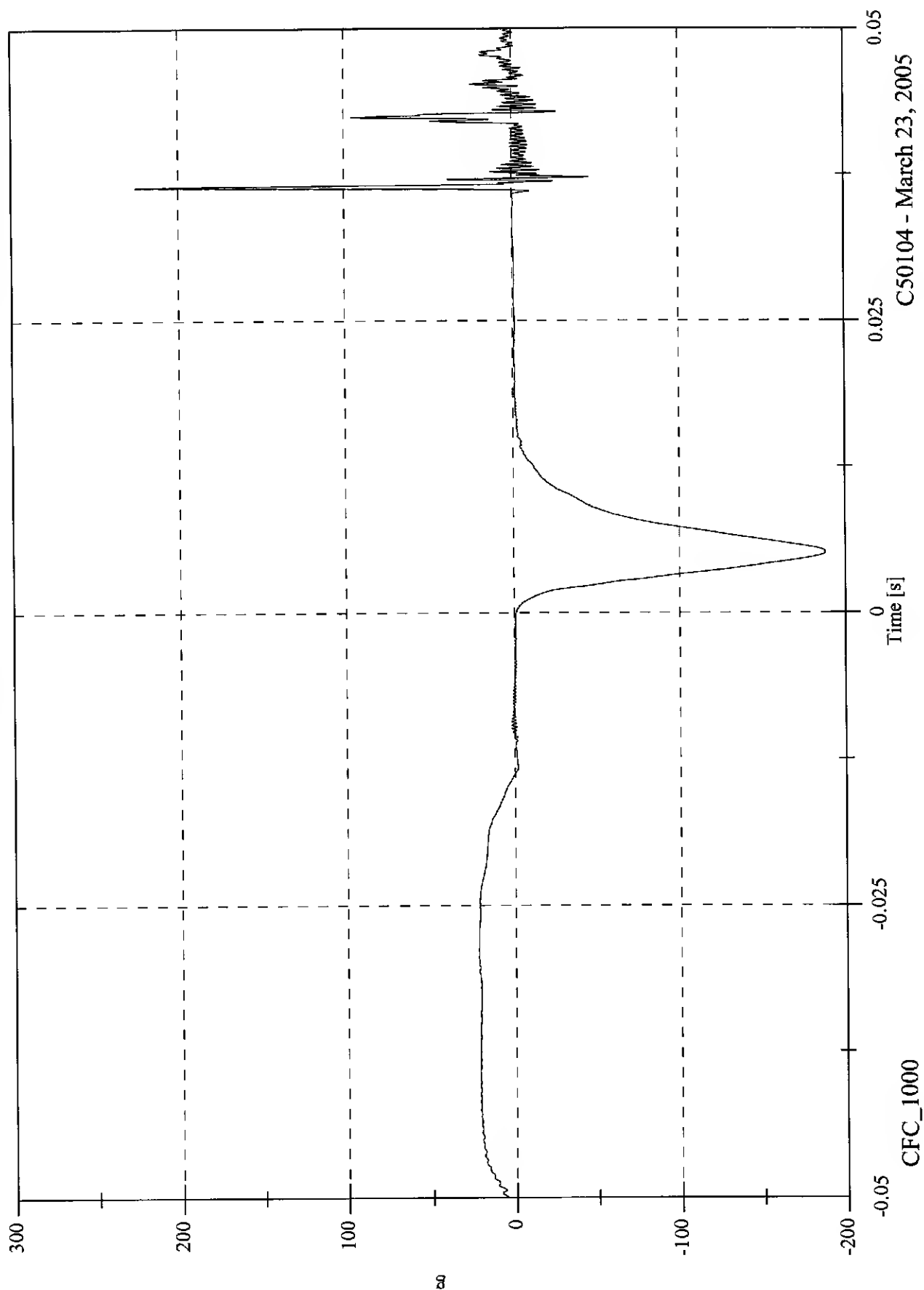
Min: 0.0 [g] at -0.085 [s]



Max: 225.3 [g] at 0.036 [s]
Min: -187.8 [g] at 0.005 [s]

Headform X Acceleration

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse



CFC_1000

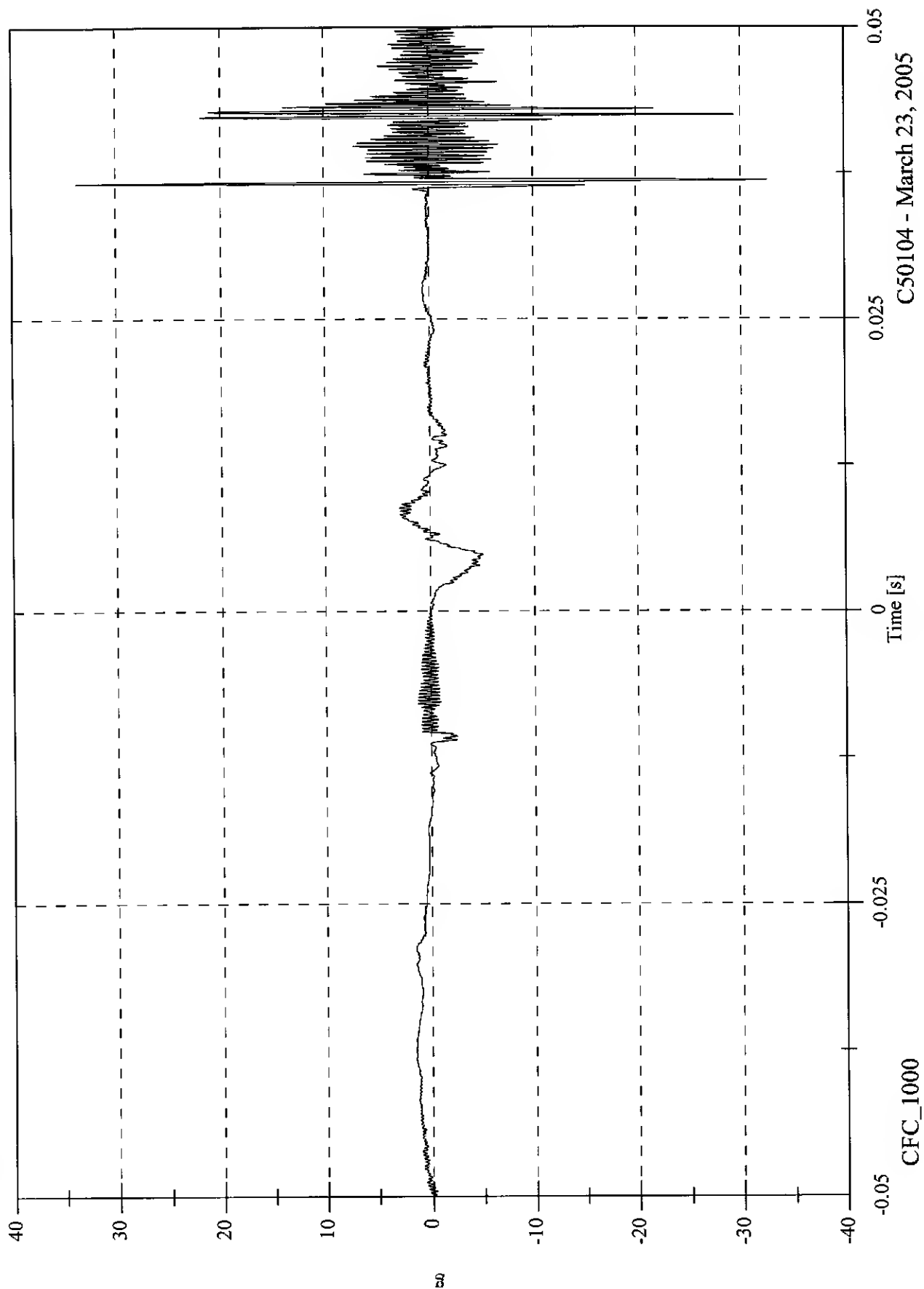
Time [s]

C50104 - March 23, 2005

Max: 33.7 [g] at 0.037 [s]
Min: -32.6 [g] at 0.037 [s]

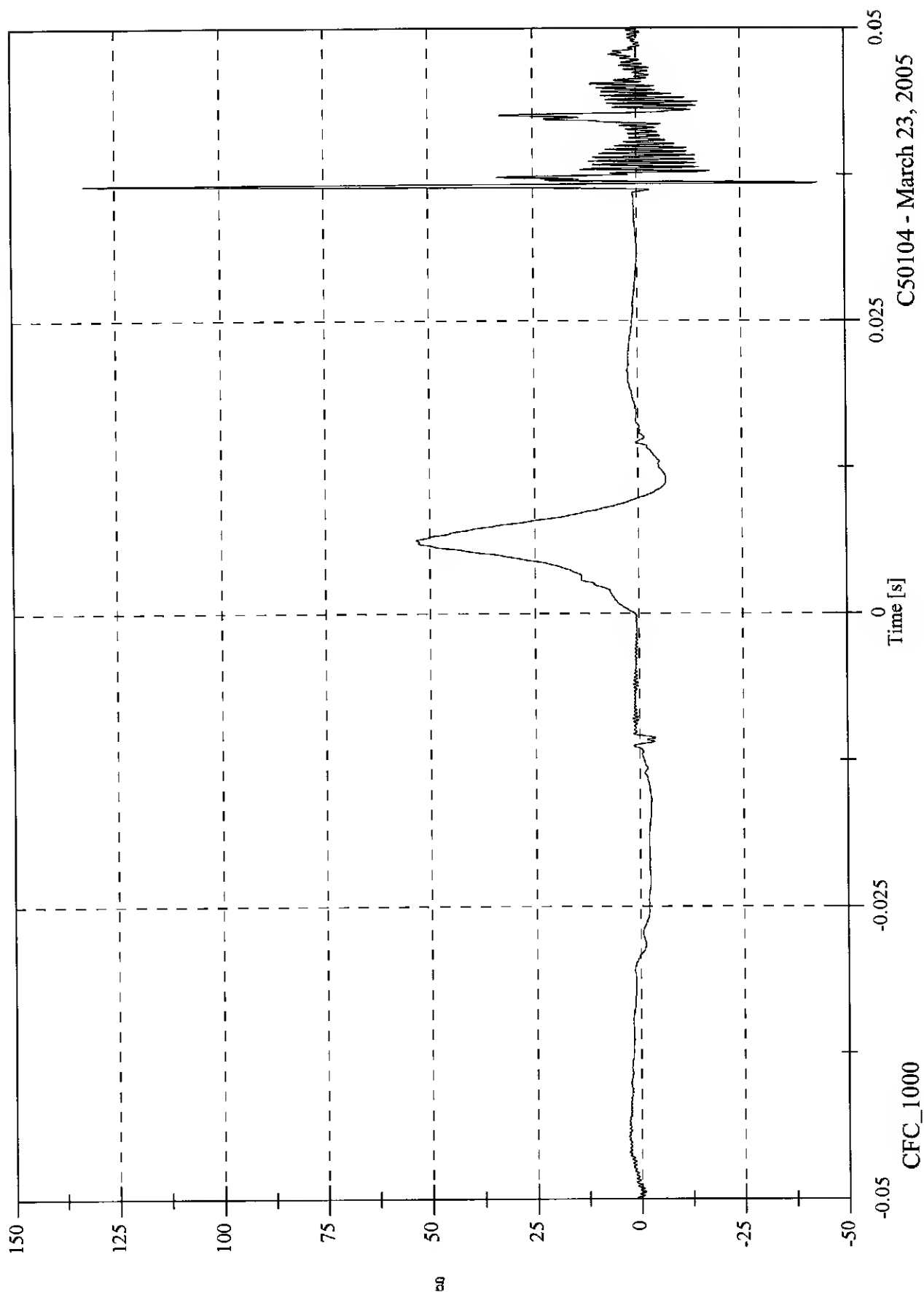
Headform Y Acceleration

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse



FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Z Acceleration

Max: 132.4 [g] at 0.037 [s]
Min: -43.5 [g] at 0.037 [s]



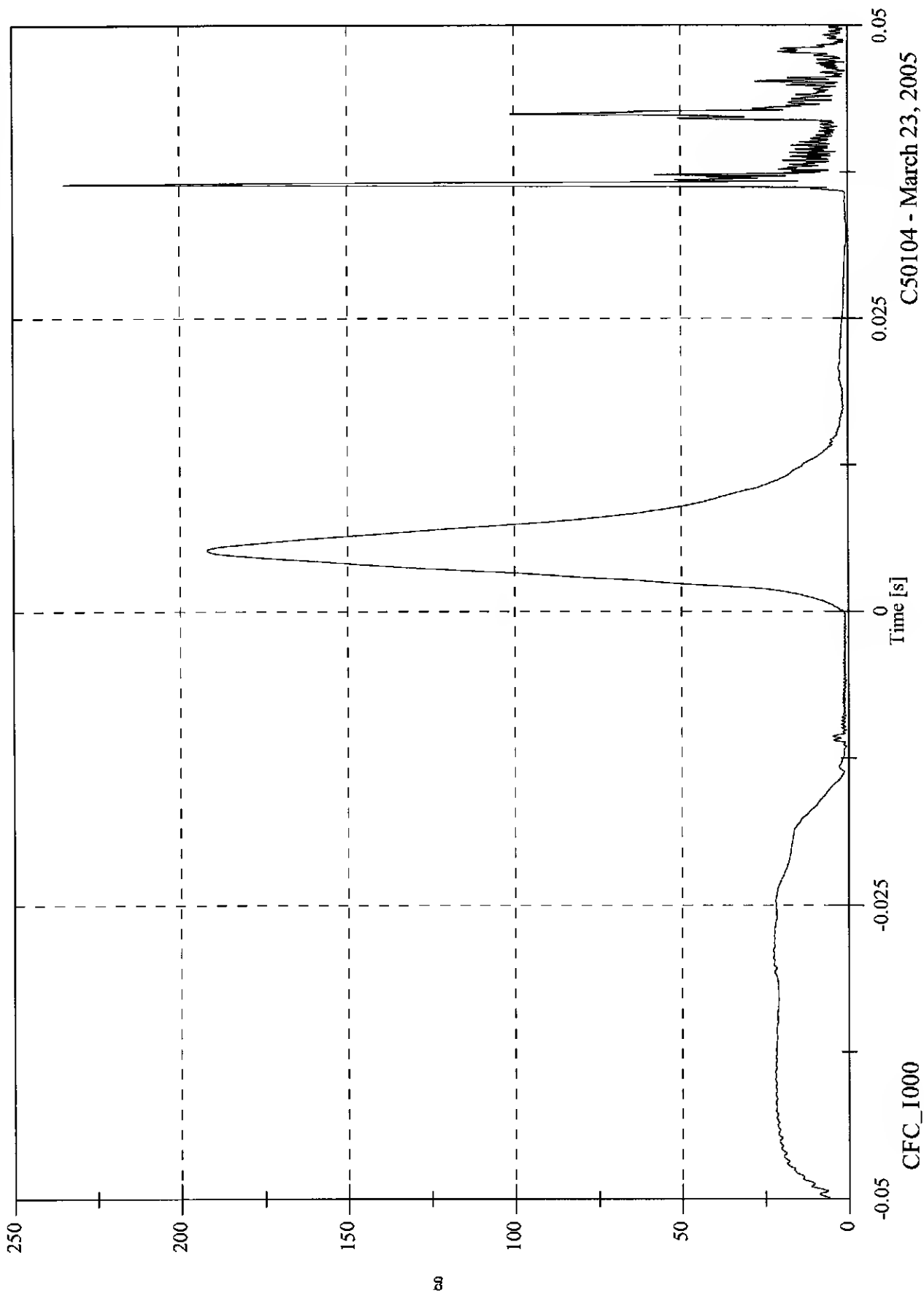
C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Resultant

Max: 234.7 [g] at 0.036 [s]

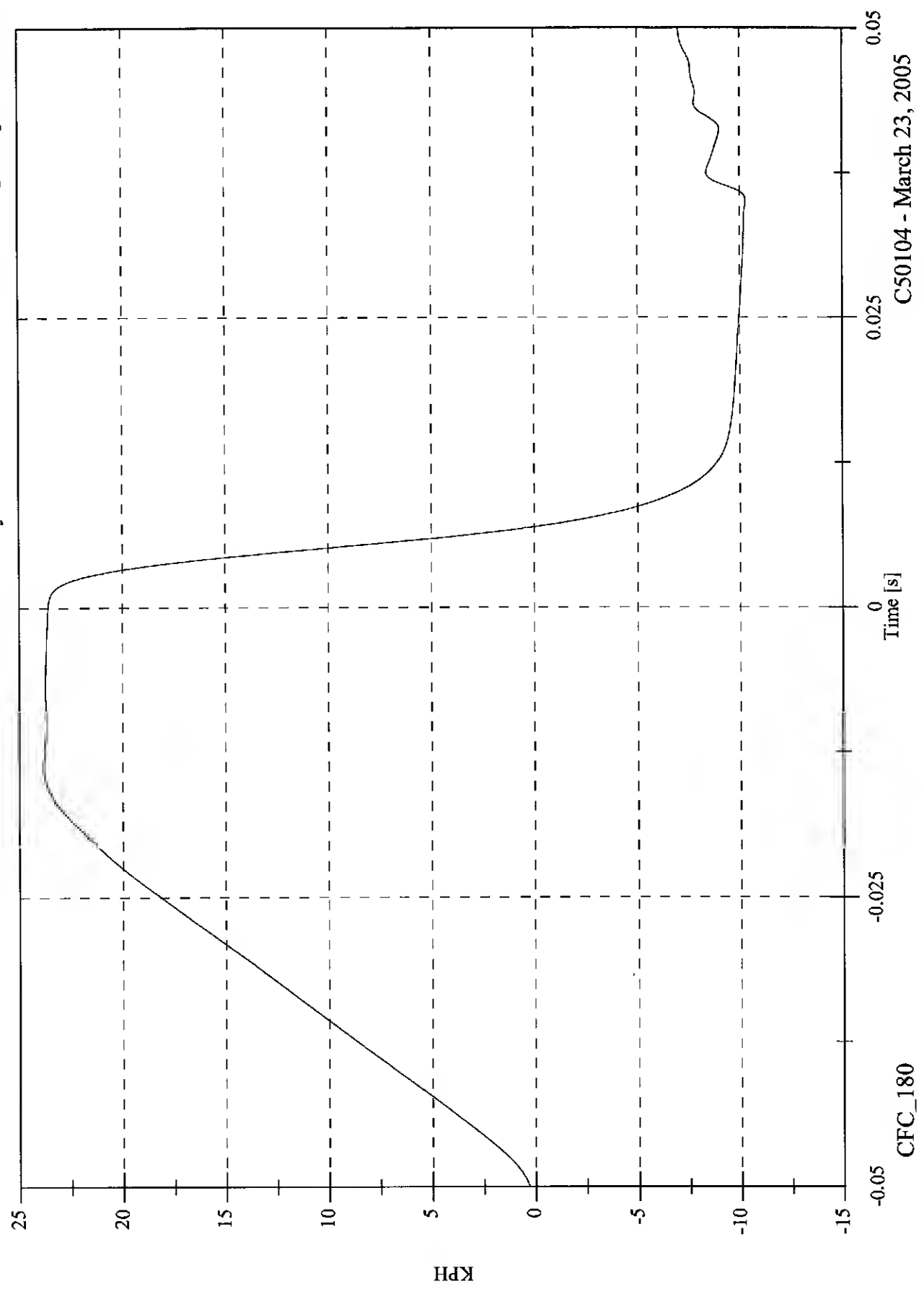
Min: 0.4 [g] at 0.032 [s]



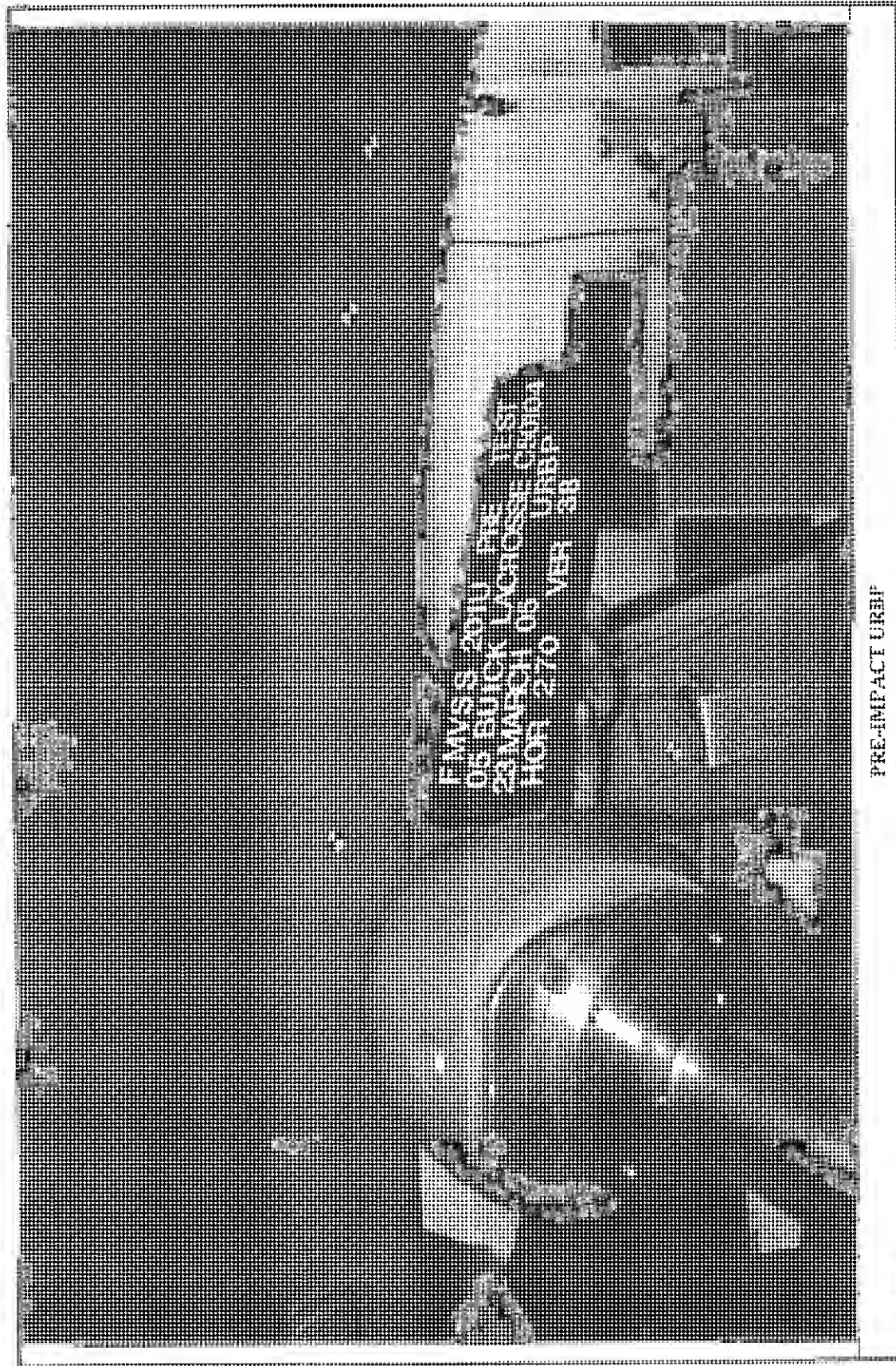
C50104 - March 23, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Max: 23.8 [KPH] at -0.014 [s]
Min: -10.3 [KPH] at 0.035 [s]

Headform Velocity



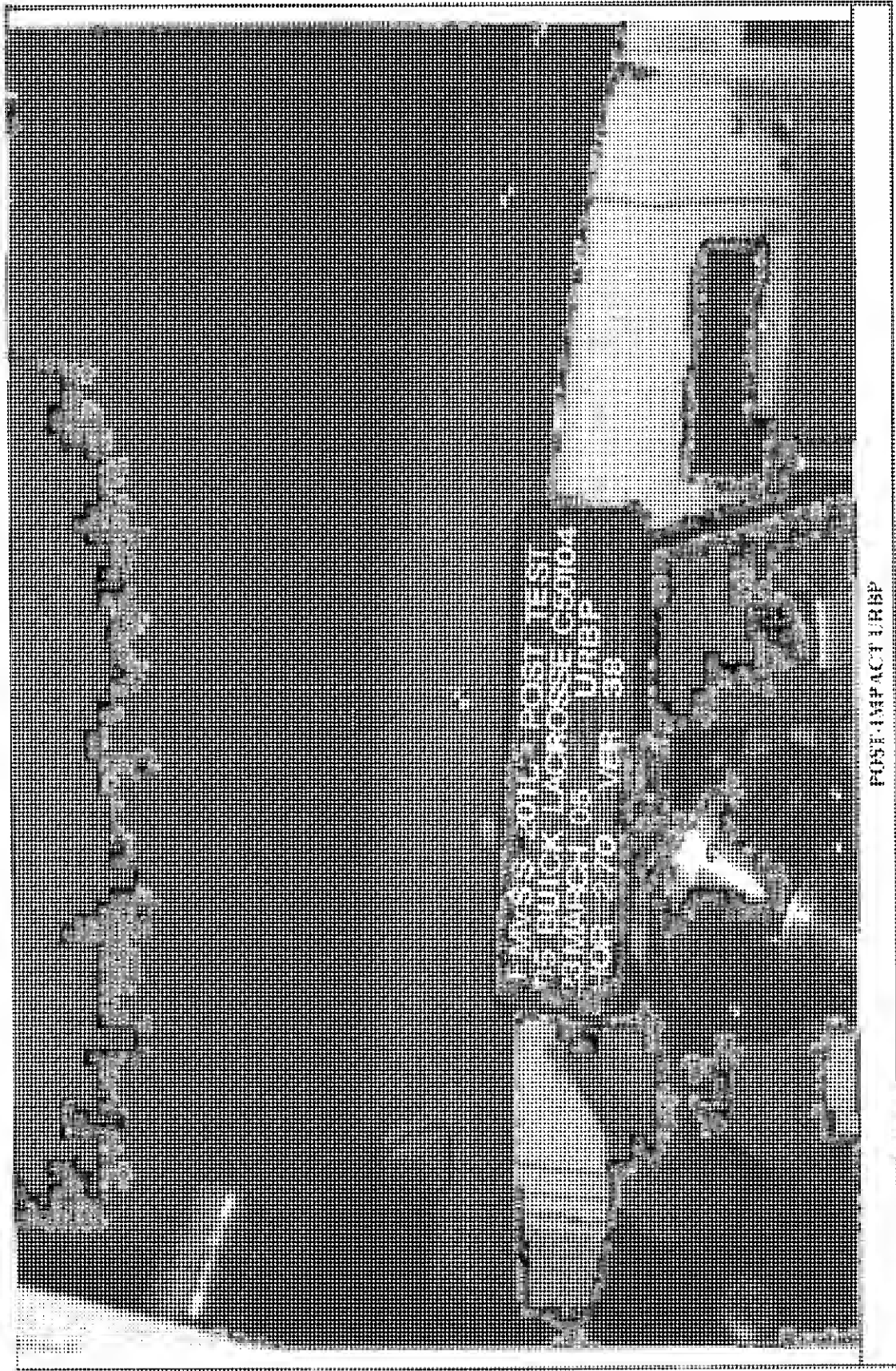
C50104 - March 23, 2005



FMVS 8 2011 PRE
06 BUICK LACROSSE 11ST
28 MARCH 06
HOB 270 VEH 38

PRE-IMPACT URB

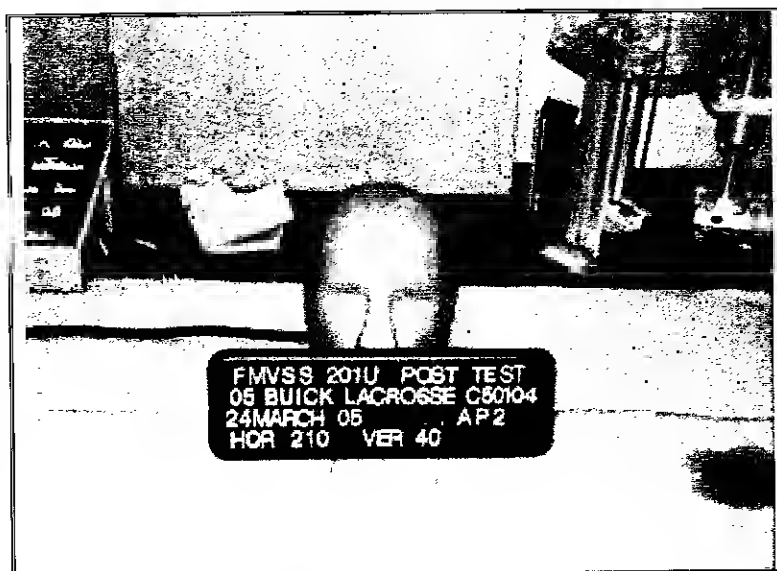
8754-FME-04



VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	10
Test Date:	03/24/05
Target Location:	A-Pillar
Target Code:	AP2
Horizontal Impact Angle:	210°
Vertical Impact Angle:	40°
Ambient Temperature:	24.3C°
Relative Humidity:	19.5
Time of Impact:	9:20
Headform Number:	355

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	24	<input checked="" type="checkbox"/>	mm right	<input type="checkbox"/> mm left
On Centerline	35		mm up	



POST-IMPACT AP2 HEADFORM

Free Motion HIC	800.1
HIC(d)	770.1
Impact Velocity (kph)	23.72
HIC T1 (msec)	4.9
HIC T2 (msec)	8.1

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - AP2

FMH Headform 0355

Location: AP2

Test Date: March 24, 2005

Work File: AP2

-----TEST RESULTS-----

Lab Temperature: 24.3 C

HICd: 770.1

Lab Humidity: 19.5 %

HIC (36ms): 800.1

Velocity at Impact: 23.72 KPH

t1: 4.9 msec

t2: 8.1 msec

Free Flight Distance: 222.65 mm

Duration: 3.2 msec

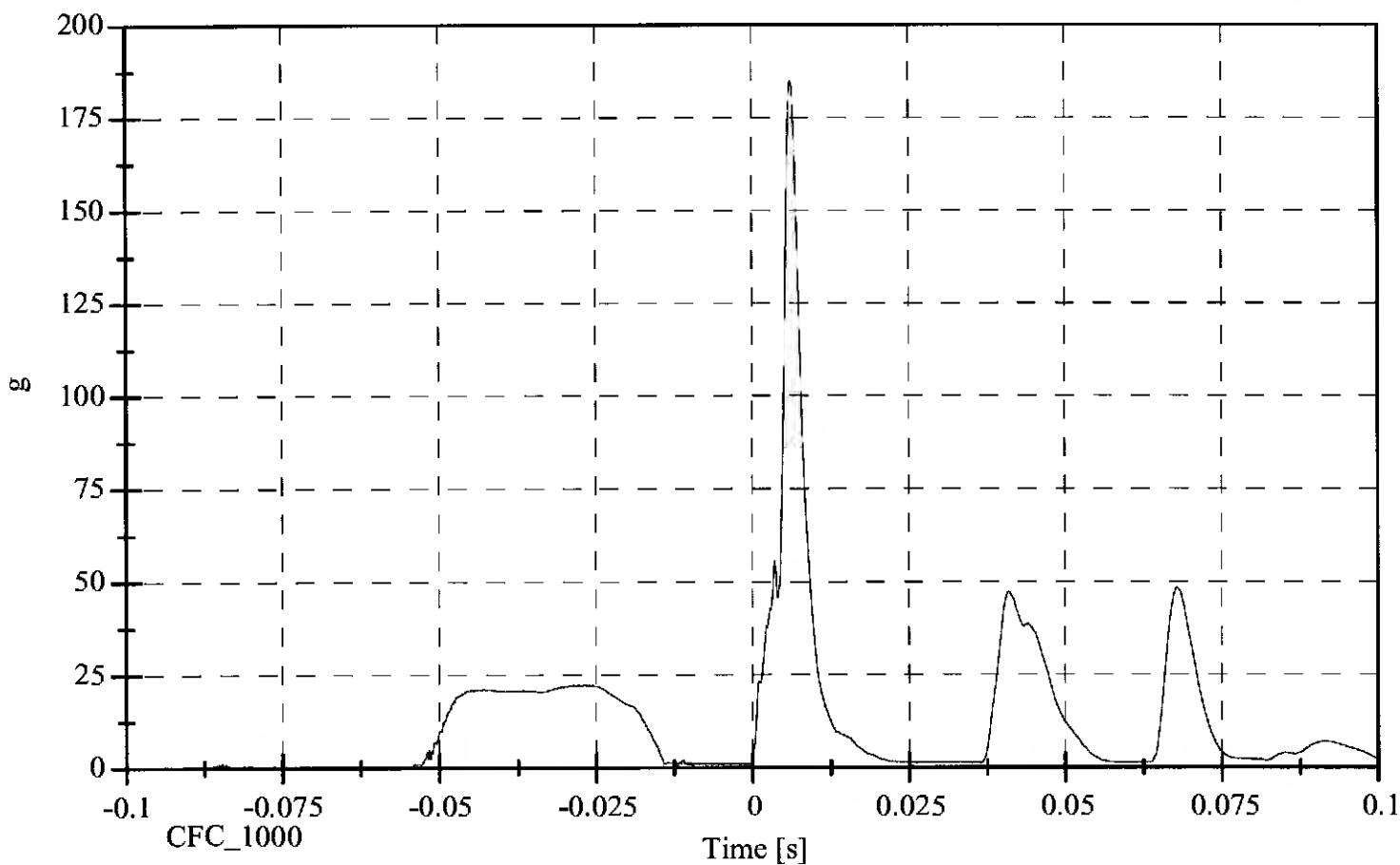
Maximum: 184.7 g

Average Acceleration: 11.9 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Resultant

Max: 184.7 [g] at 0.006 [s]

Min: 0.0 [g] at -0.057 [s]

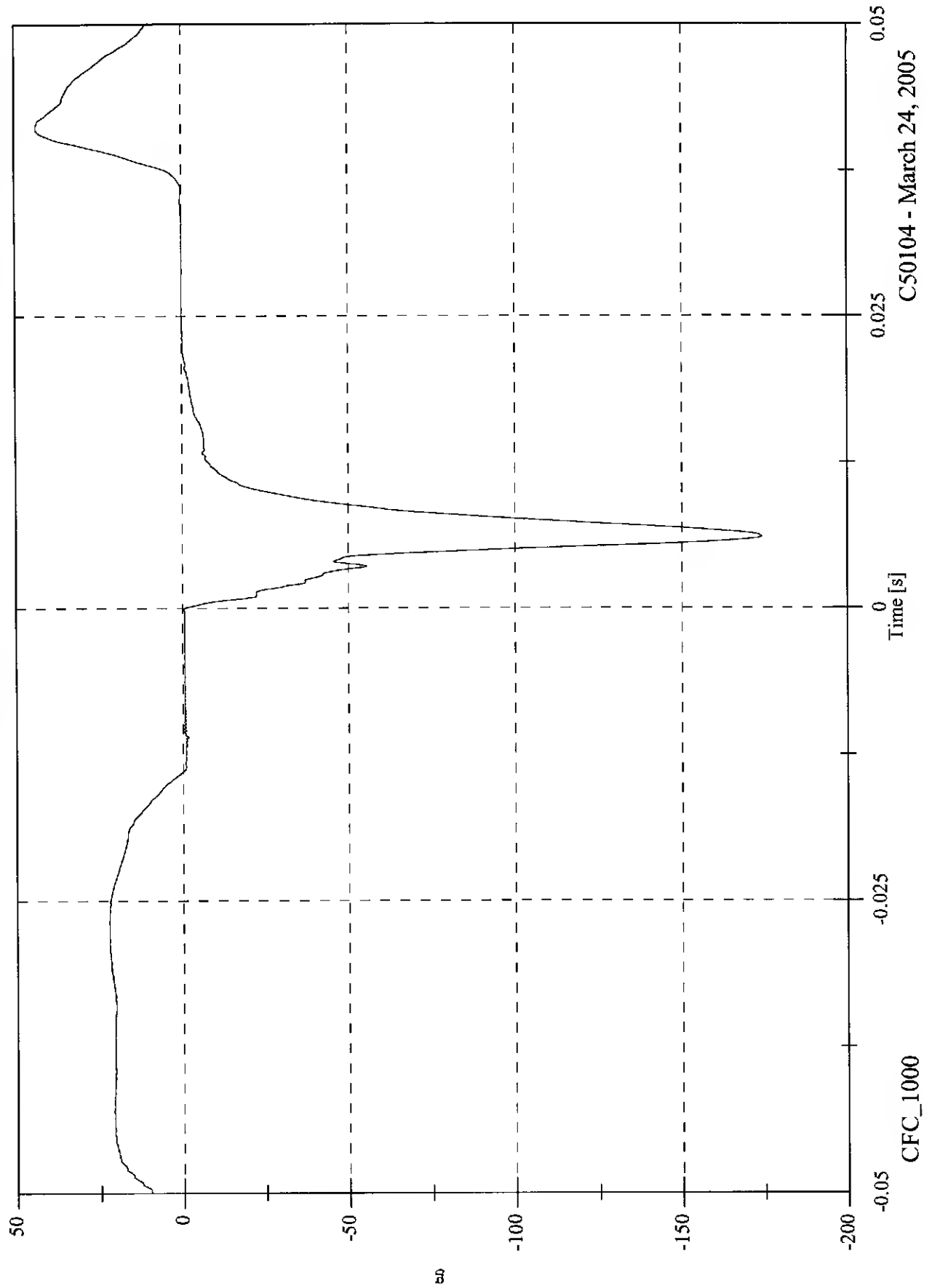


FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform X Acceleration

Max: 43.5 [g] at 0.041 [s]

Min: -174.1 [g] at 0.006 [s]



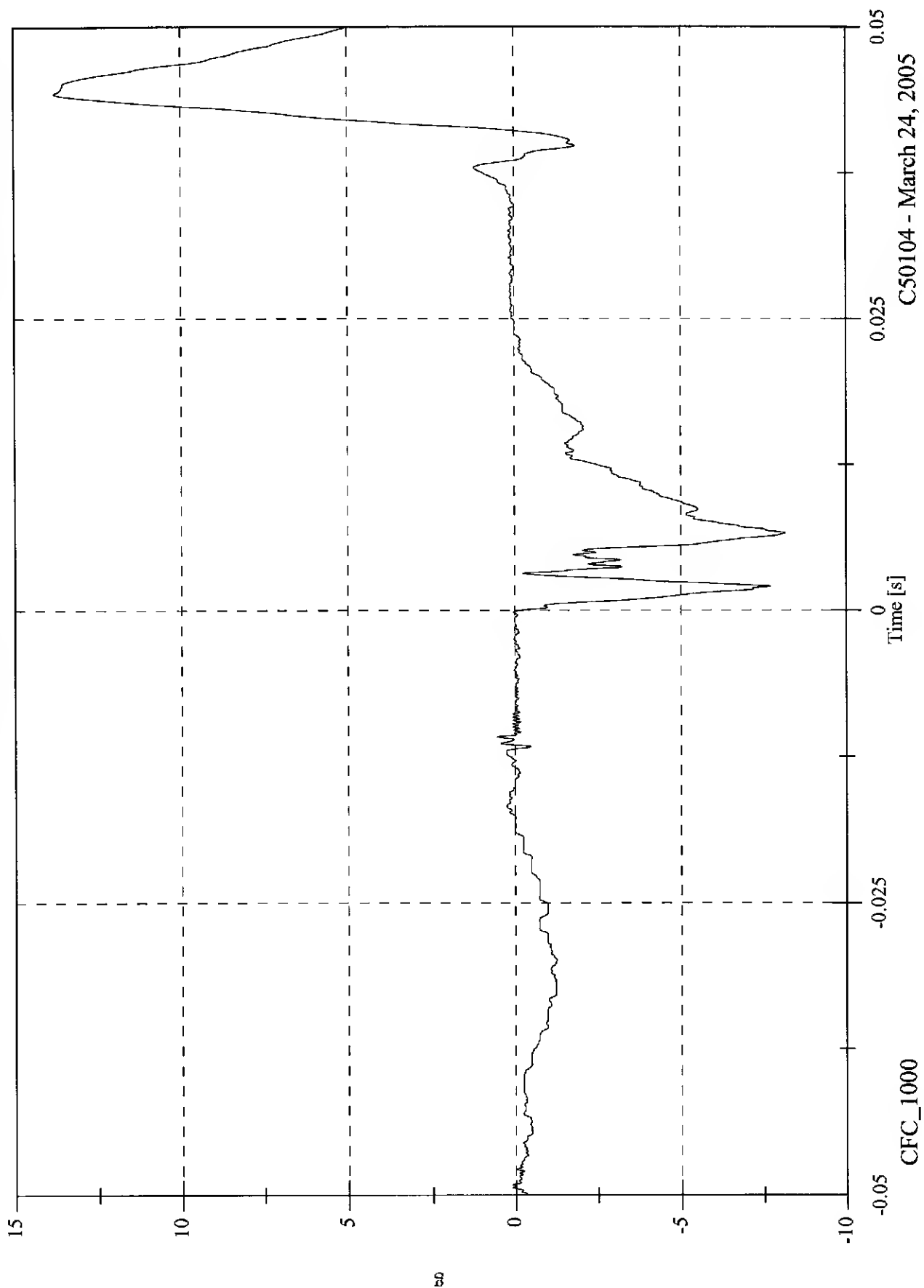
C50104 - March 24, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Y Acceleration

Max: 13.8 [g] at 0.044 [s]

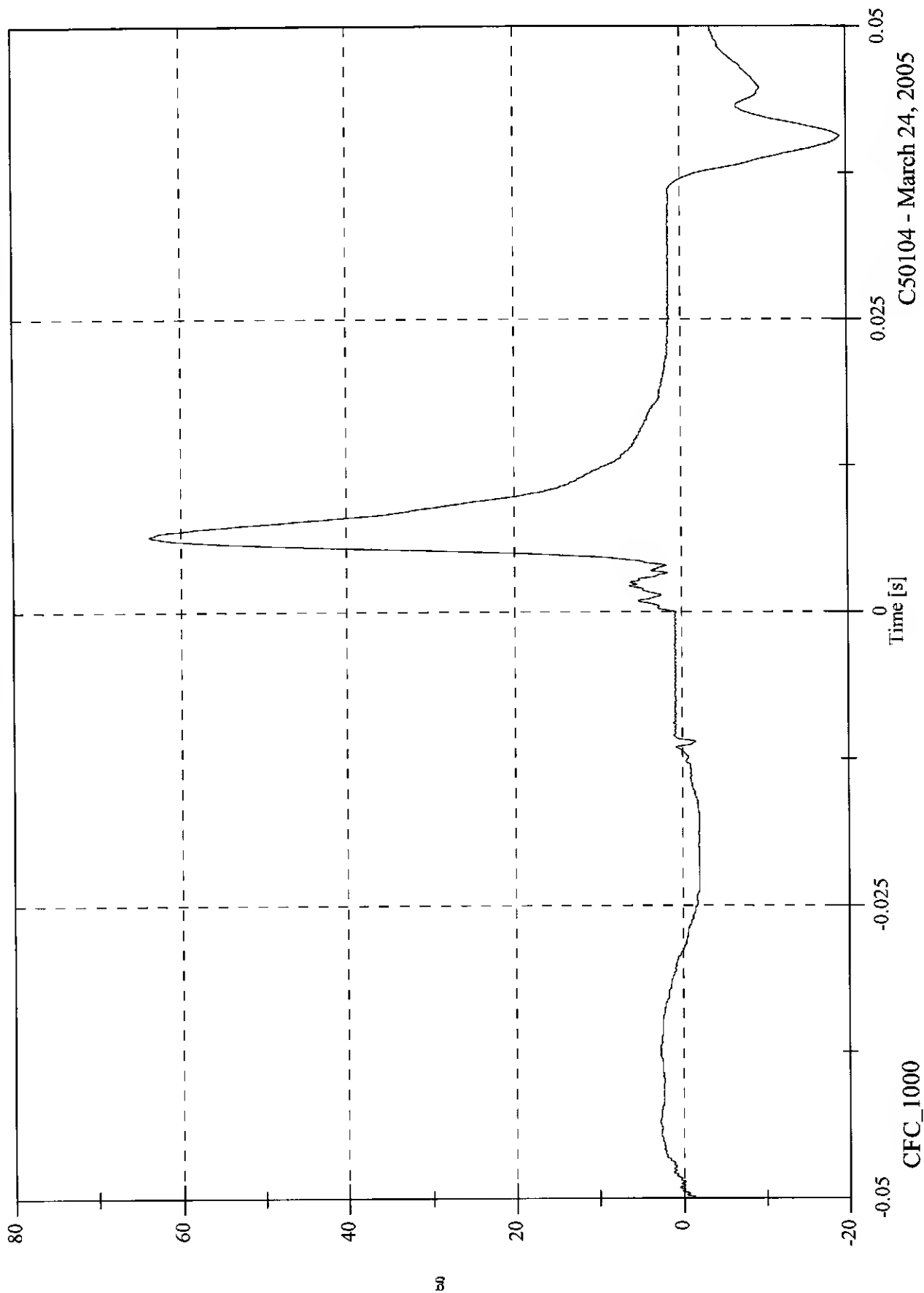
Min: -8.2 [g] at 0.007 [s]



C50104 - March 24, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Z Acceleration

Max: 63.8 [g] at 0.006 [s]
Min: -19.2 [g] at 0.041 [s]



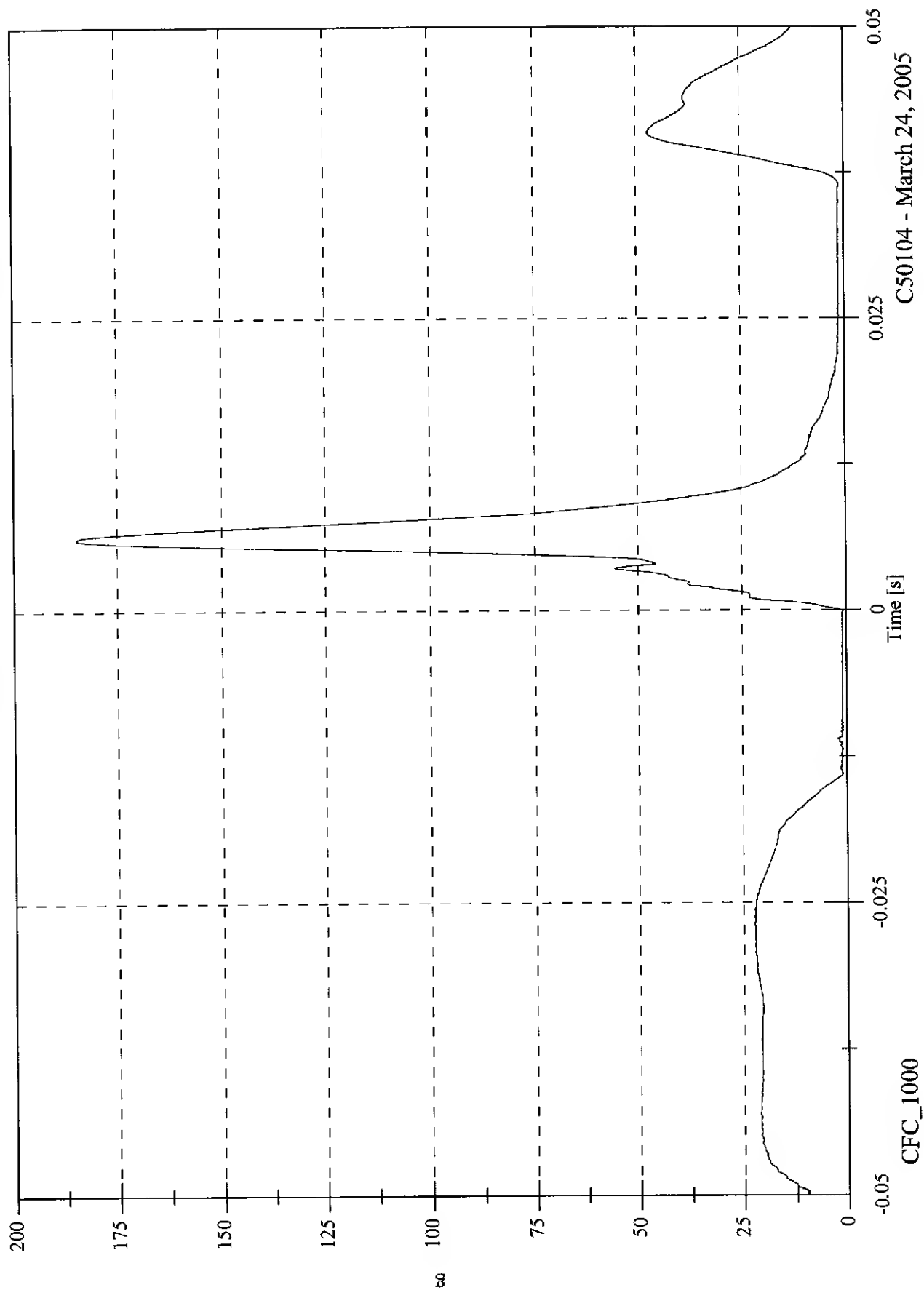
C50104 - March 24, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

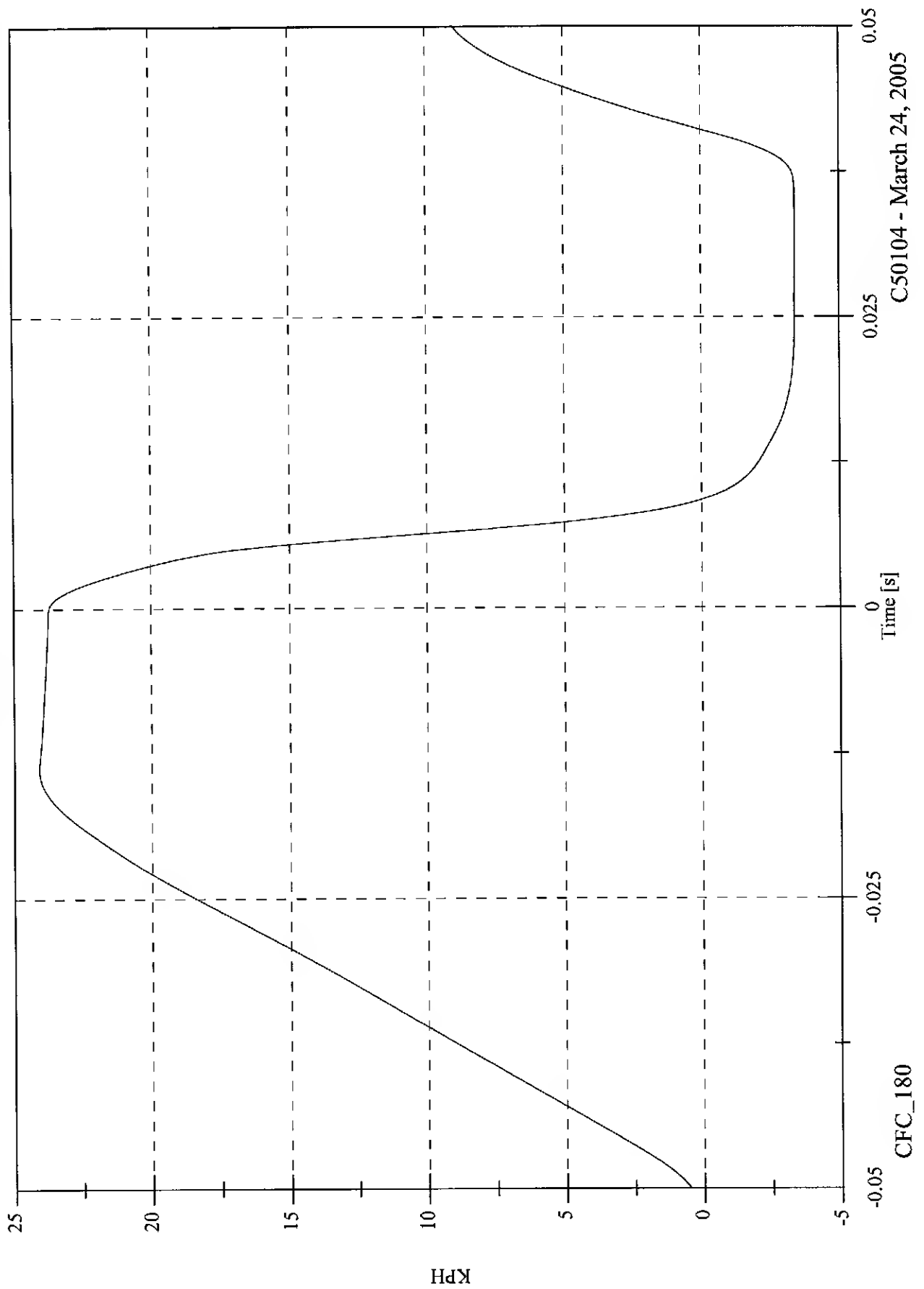
Headform Resultant

Max: 184.7 [g] at 0.006 [s]

Min: 0.8 [g] at -0.000 [s]



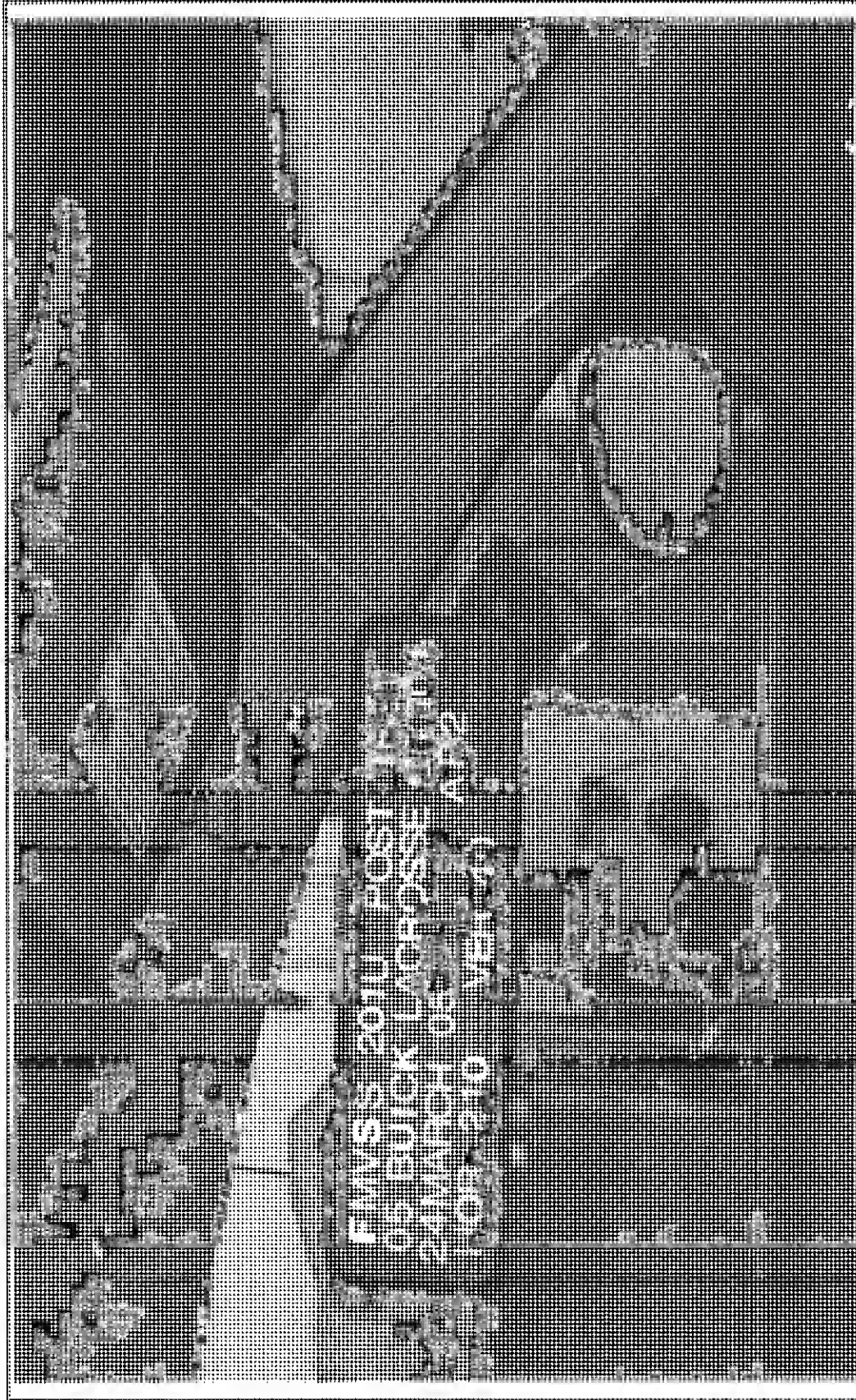
FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Velocity
Max: 24.1 [KPH] at -0.014 [s]
Min: -3.4 [KPH] at 0.034 [s]





PRE-IMPACT AP2

8754-FME-04



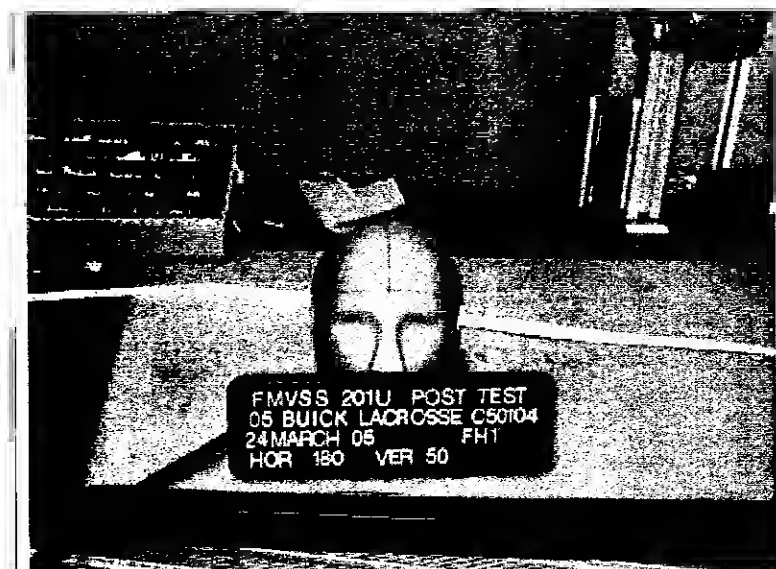
POST-IMPACT AP2

8754-TMH-04

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL)
COLOR:	Red

Test Number:	11
Test Date:	03/24/05
Target Location:	Front Header
Target Code:	FH1
Horizontal Impact Angle:	180°
Vertical Impact Angle:	50°
Ambient Temperature:	24.6C°
Relative Humidity:	19.5
Time of Impact:	9:45
Headform Number:	642

Impact Point Description (from lower midpoint on midsagittal line)				
On Centerline	14	<input checked="" type="checkbox"/>	mm right	<input type="checkbox"/> mm left
On Centerline	24		mm up	



POST-IMPACT FH1 HEADFORM

Free Motion HIC	570.7
HIC(d)	597.0
Impact Velocity (kph)	23.74
HIC T1 (msec)	2.8
HIC T2 (msec)	6.6

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - FH1

FMH Headform 0642

Location: FH1

Test Date: March 24, 2005

Work File: FH1

-----TEST RESULTS-----

Lab Temperature: 24.6 C

HICd: 597.0

Lab Humidity: 19.5 %

HIC (36ms): 570.7

Velocity at Impact: 23.74 KPH

t1: 2.8 msec

t2: 6.6 msec

Free Flight Distance: 200.28 mm

Duration: 3.8 msec

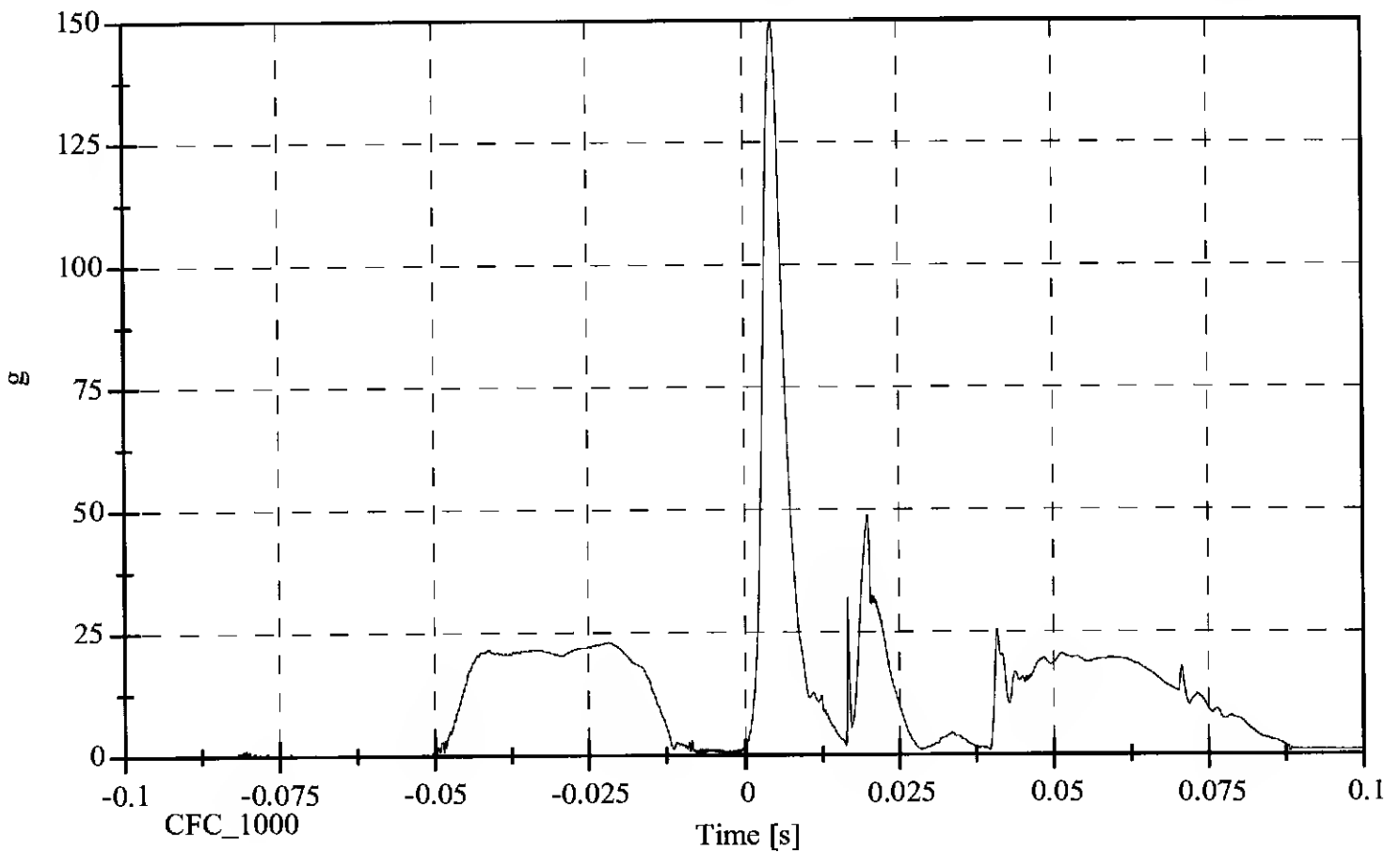
Maximum: 149.8 g

Average Acceleration: 11.5 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform Resultant

Max: 149.8 [g] at 0.004 [s]

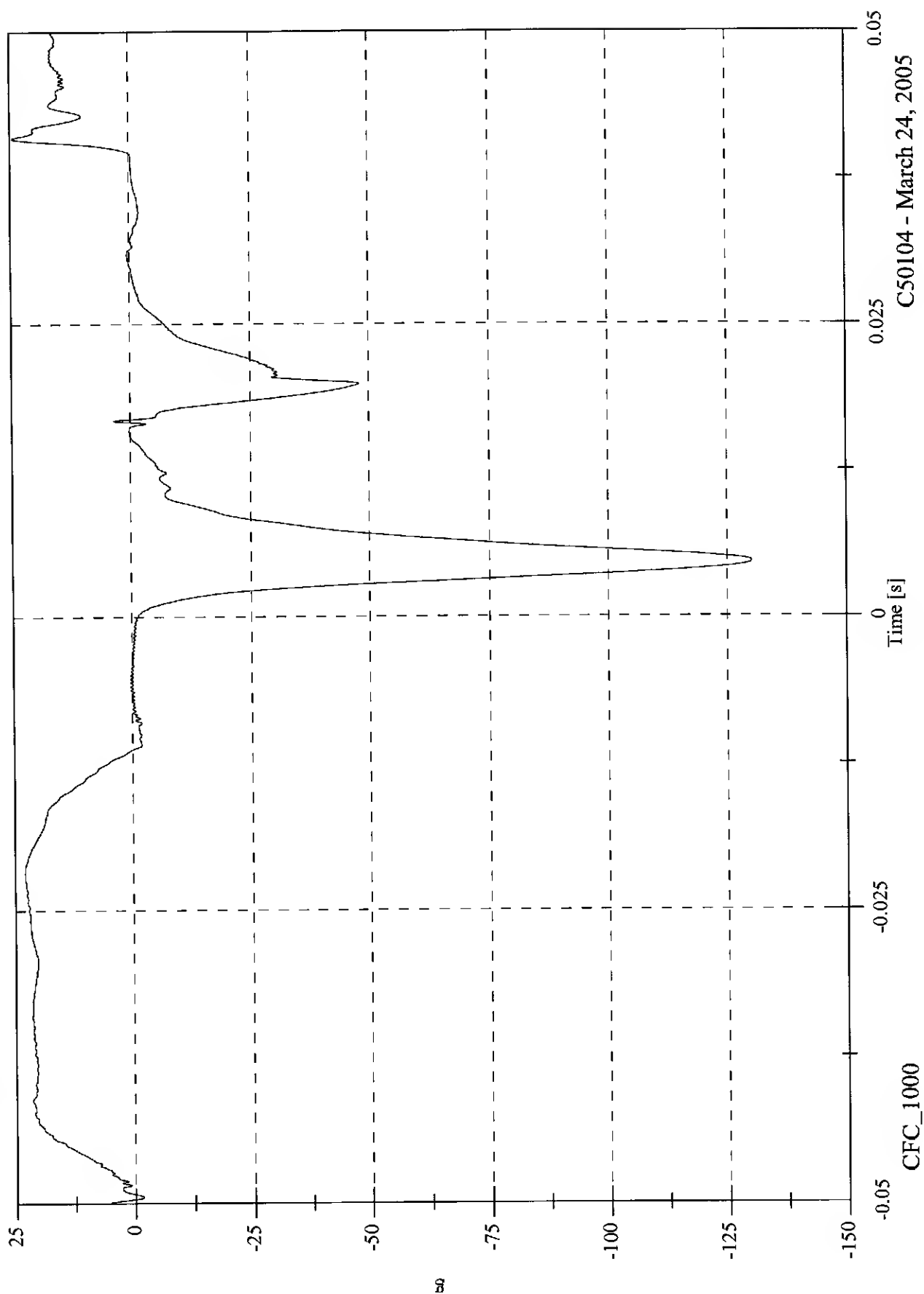
Min: 0.0 [g] at -0.082 [s]



Max: 24.5 [g] at 0.041 [s]
Min: -130.2 [g] at 0.005 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform X Acceleration



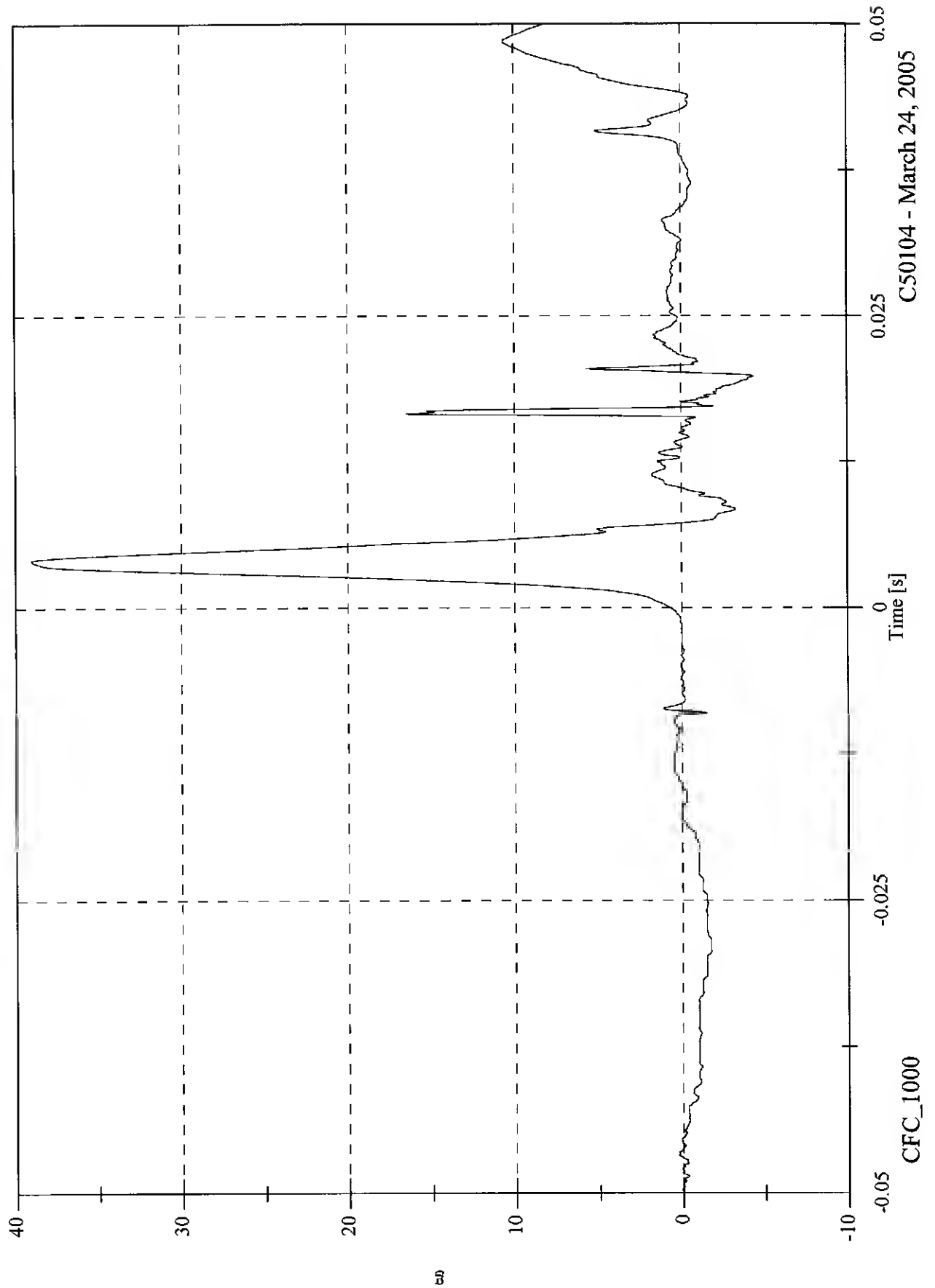
C50104 - March 24, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Max: 39.0 [g] at 0.004 [s]

Min: -4.4 [g] at 0.020 [s]

Headform Y Acceleration

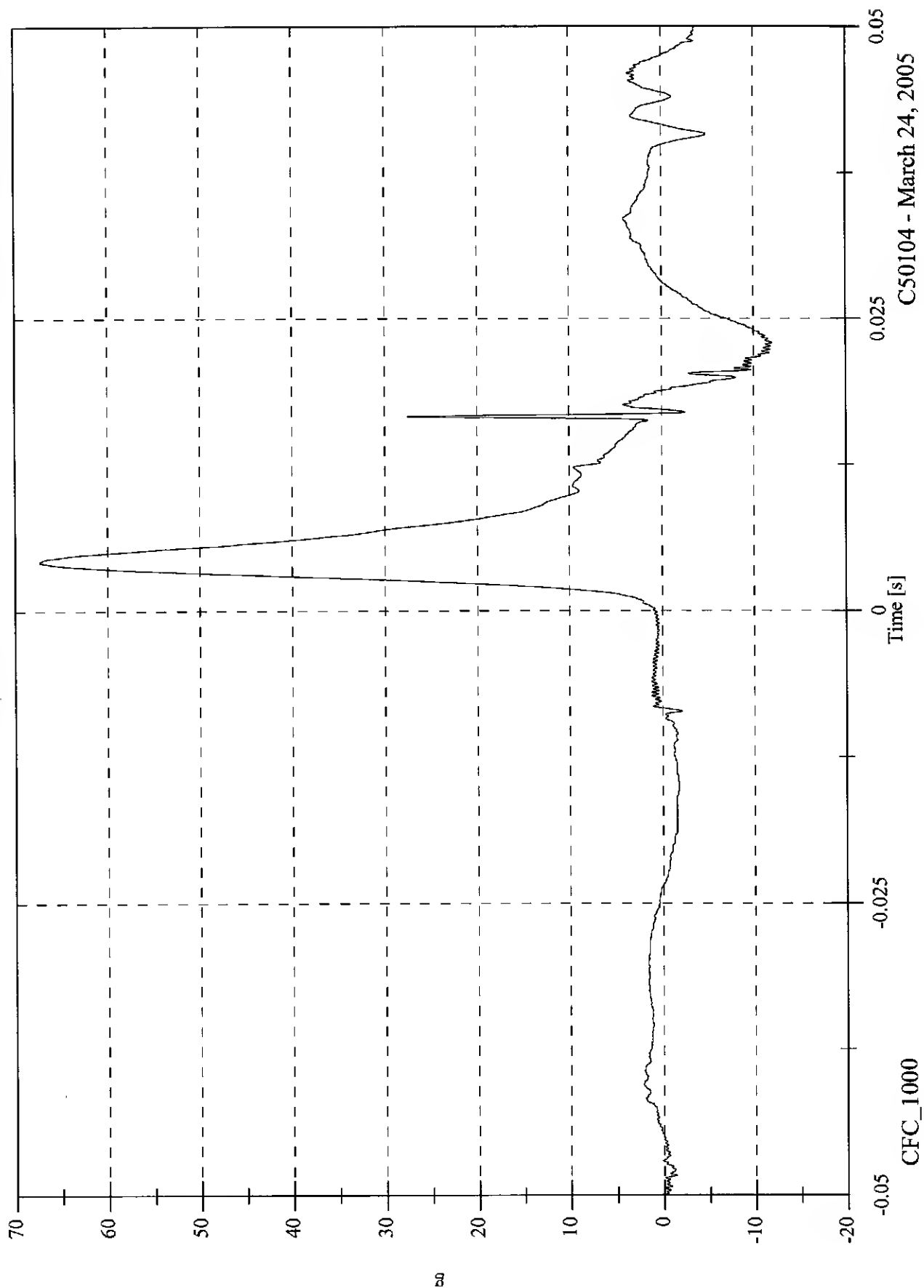


C50104 - March 24, 2005

Max: 67.4 [g] at 0.004 [s]
Min: -12.0 [g] at 0.023 [s]

Headform Z Acceleration

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse



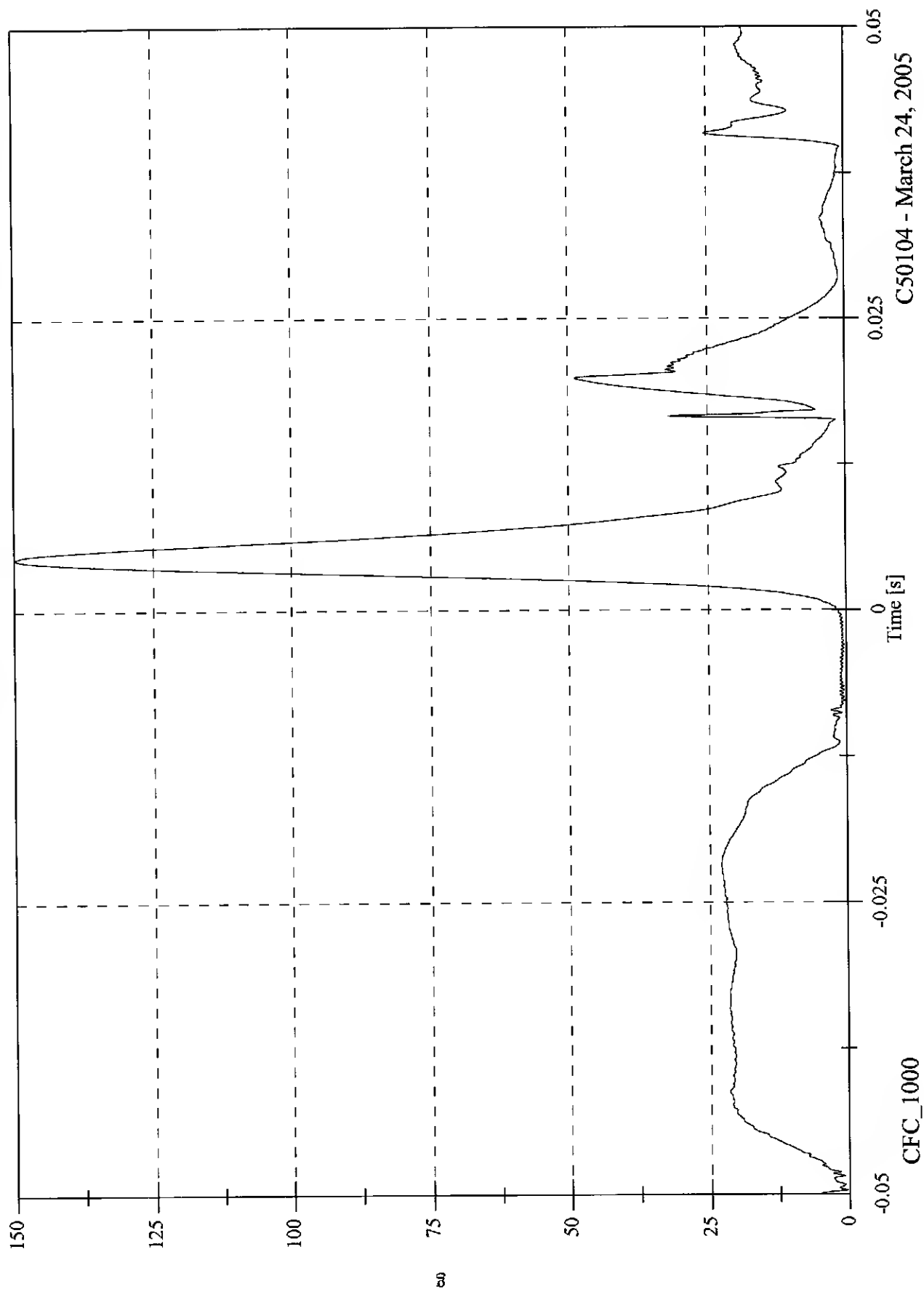
C50104 - March 24, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Resultant

Max: 149.8 [g] at 0.004 [s]

Min: 0.3 [g] at -0.008 [s]

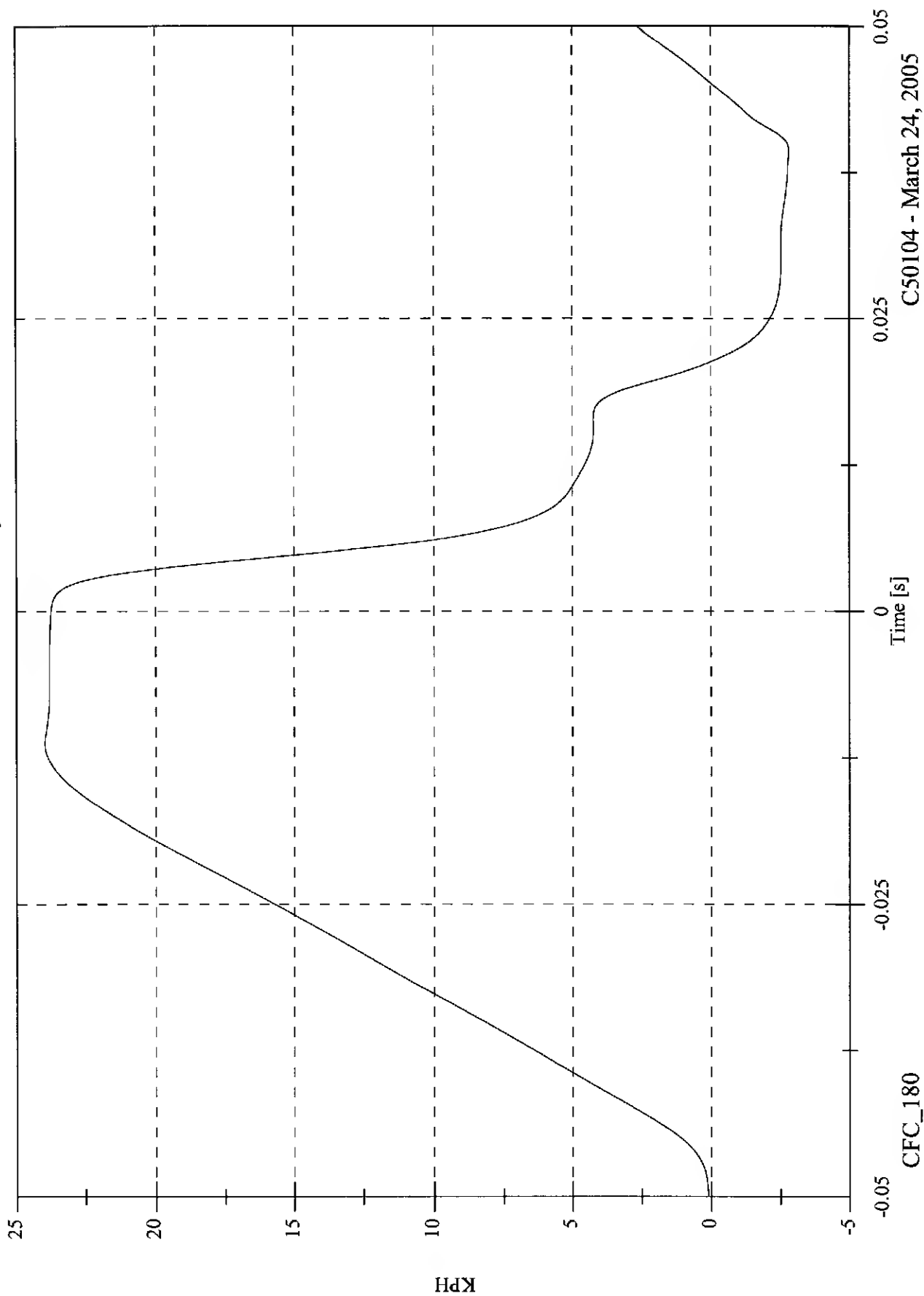


C50104 - March 24, 2005

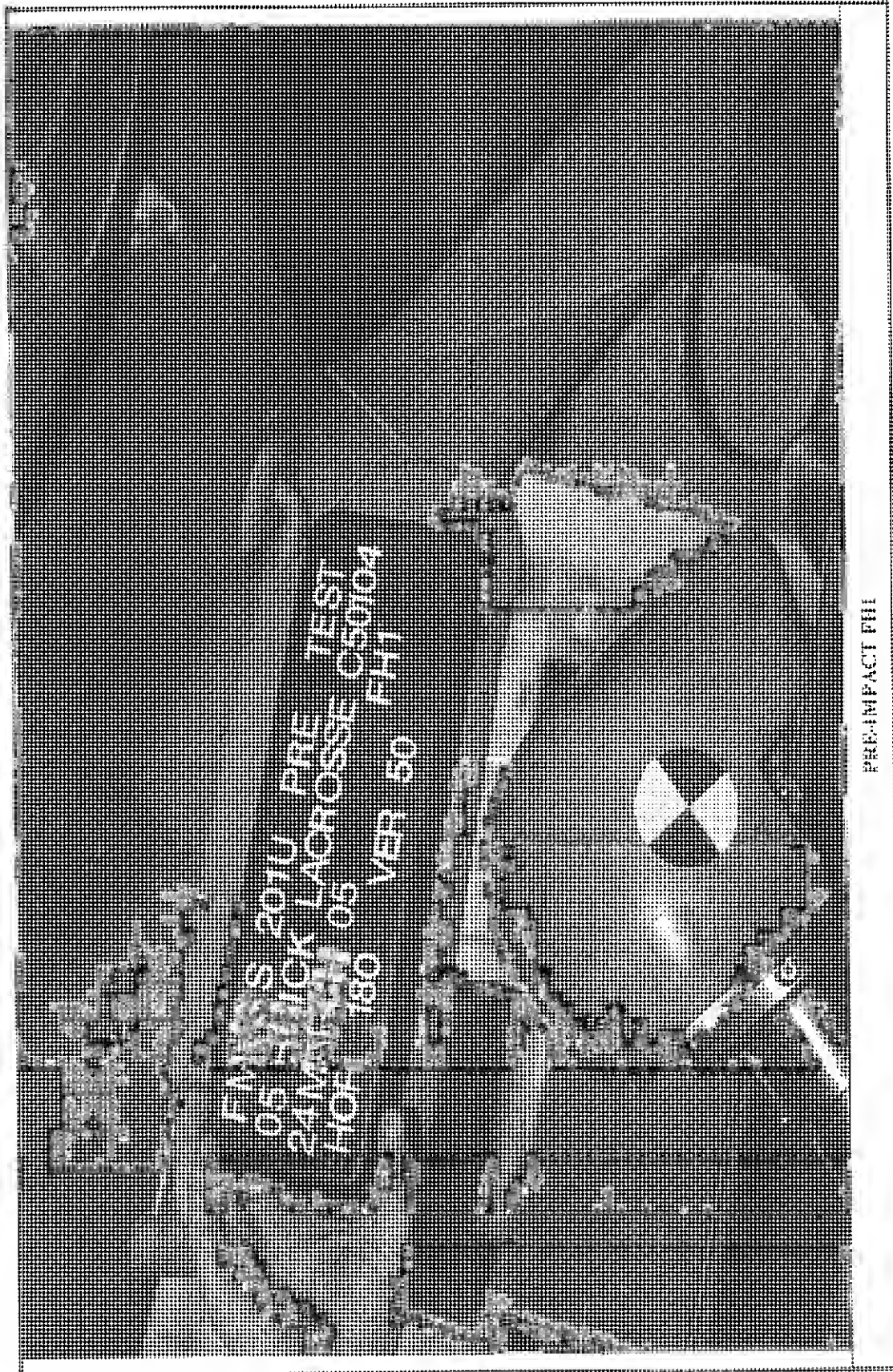
Max: 24.0 [KPH] at -0.011 [s]
Min: -2.8 [KPH] at 0.039 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Velocity



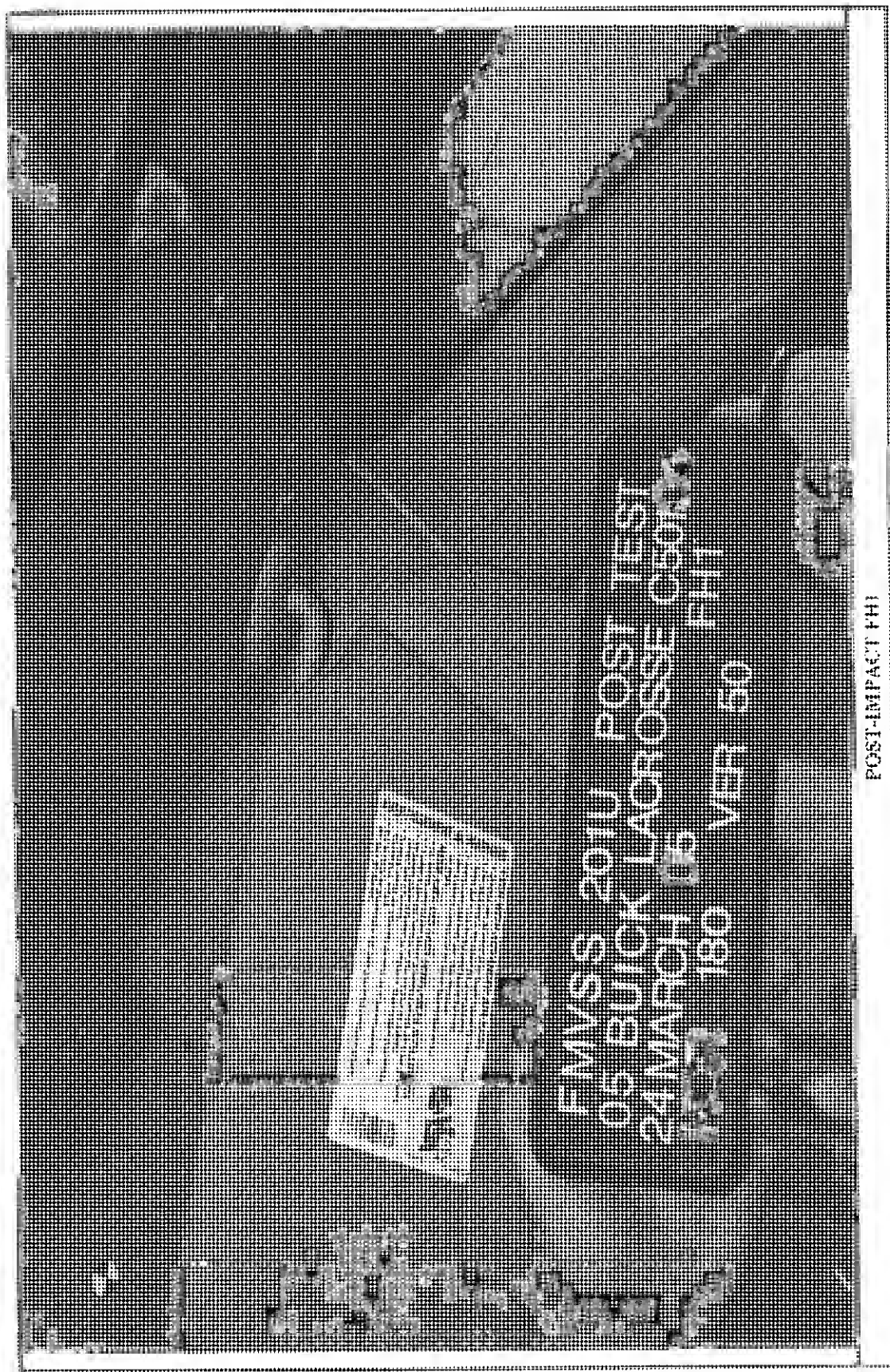
C50104 - March 24, 2005



FALL 2010 PRE TEST
05 24MAY01 05 C50104
1101 180 VER 50 FH1

PRE-IMPACT PH1

8754-FMH-04



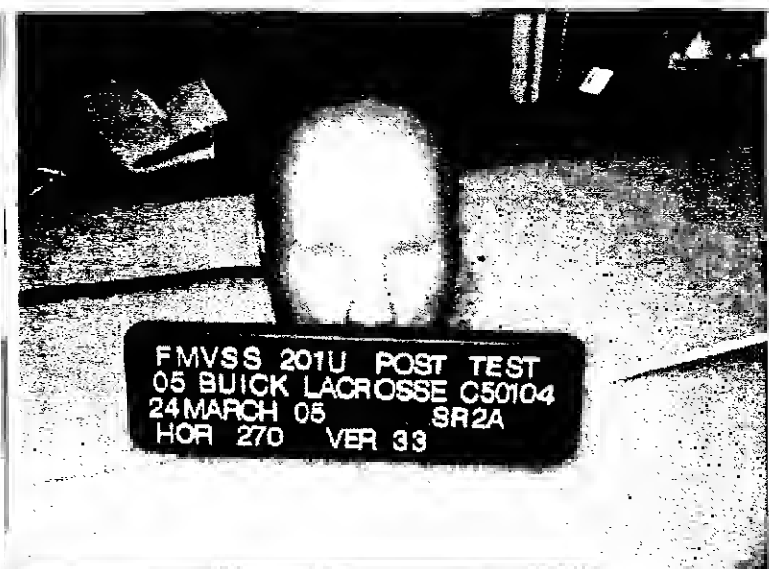
FMVSS 2010 POST TEST
05 BUICK LACROSSE C5010
24 MARCH 15 FH1
13:31 180 VER 50

POST-IMPACT FH1

VEHICLE YEAR/MAKE/MODEL/STYLE:	2005 Buick LaCrosse 4-Door Sedan
VIN:	2G4WC532451200267
DATE OF MANUFACTURE:	10/04(SEE CERTIFICATION LABEL.)
COLOR:	Red

Test Number:	12
Test Date:	03/24/05
Target Location:	Side Rail
Target Code:	SR2A
Horizontal Impact Angle:	270°
Vertical Impact Angle:	33°
Ambient Temperature:	24.6C°
Relative Humidity:	20.1
Time of Impact:	10:30
Headform Number:	805

Impact Point Description (from lower midpoint on midsagittal line)			
On Centerline	5	<input type="checkbox"/> mm right	<input checked="" type="checkbox"/> mm left
On Centerline	15	mm up	



POST-IMPACT SR2A HEADFORM

Free Motion HIC	820.3
HIC(d)	785.3
Impact Velocity (kph)	23.48
HIC T1 (msec)	2.0
HIC T2 (msec)	8.2

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse C50104 - SR2A

FMH Headform 805

Location: SR2A

Test Date: March 24, 2005

Work File: SR2A

-----TEST RESULTS-----

Lab Temperature: 24.6 C

HICd: 785.3

Lab Humidity: 20.1 %

HIC (36ms): 820.3

Velocity at Impact: 23.48 KPH

t1: 2.0 msec

t2: 8.2 msec

Free Flight Distance: 213.23 mm

Duration: 6.2 msec

Maximum: 166.9 g

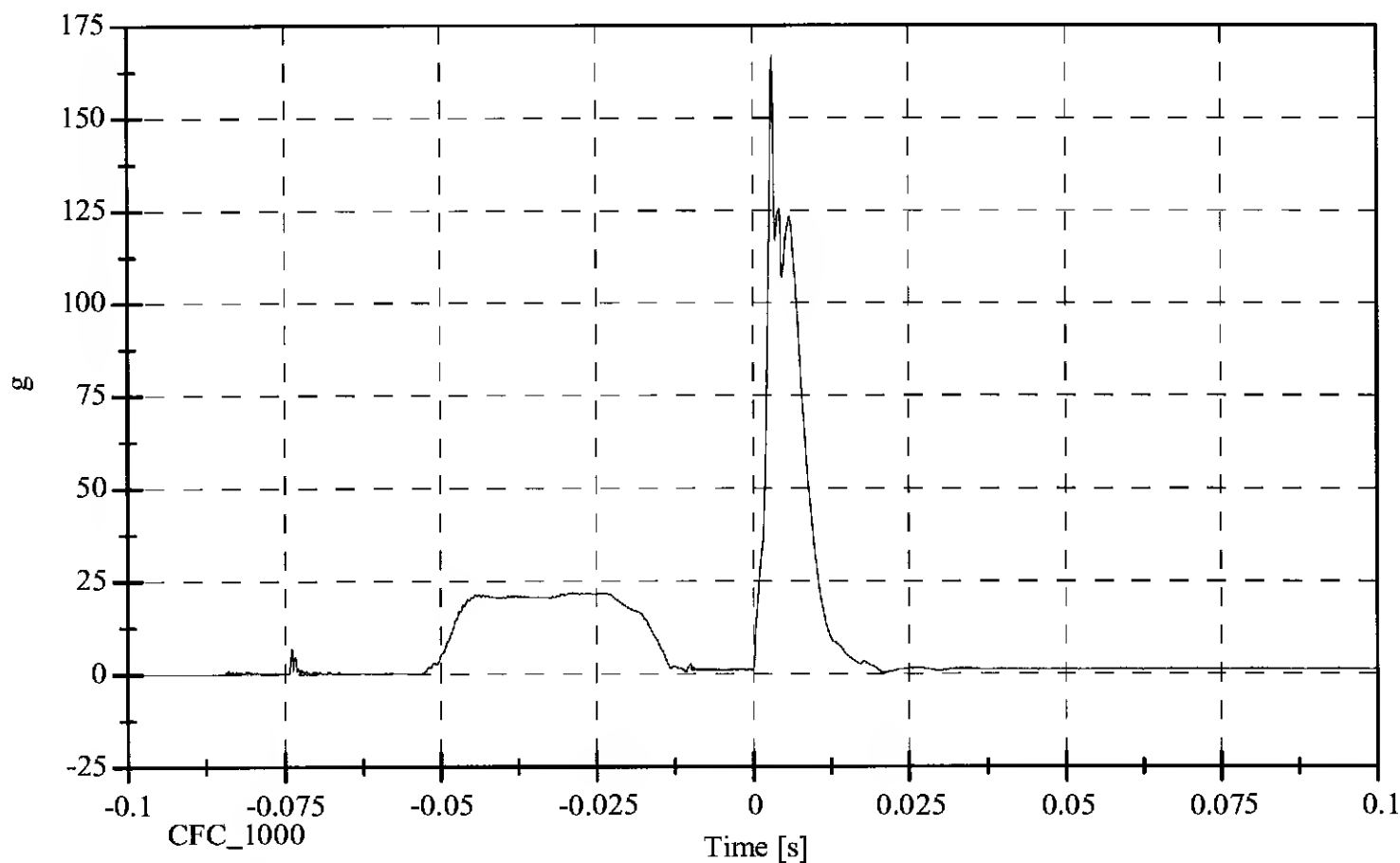
Average Acceleration: 8.6 g

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Max: 166.9 [g] at 0.003 [s]

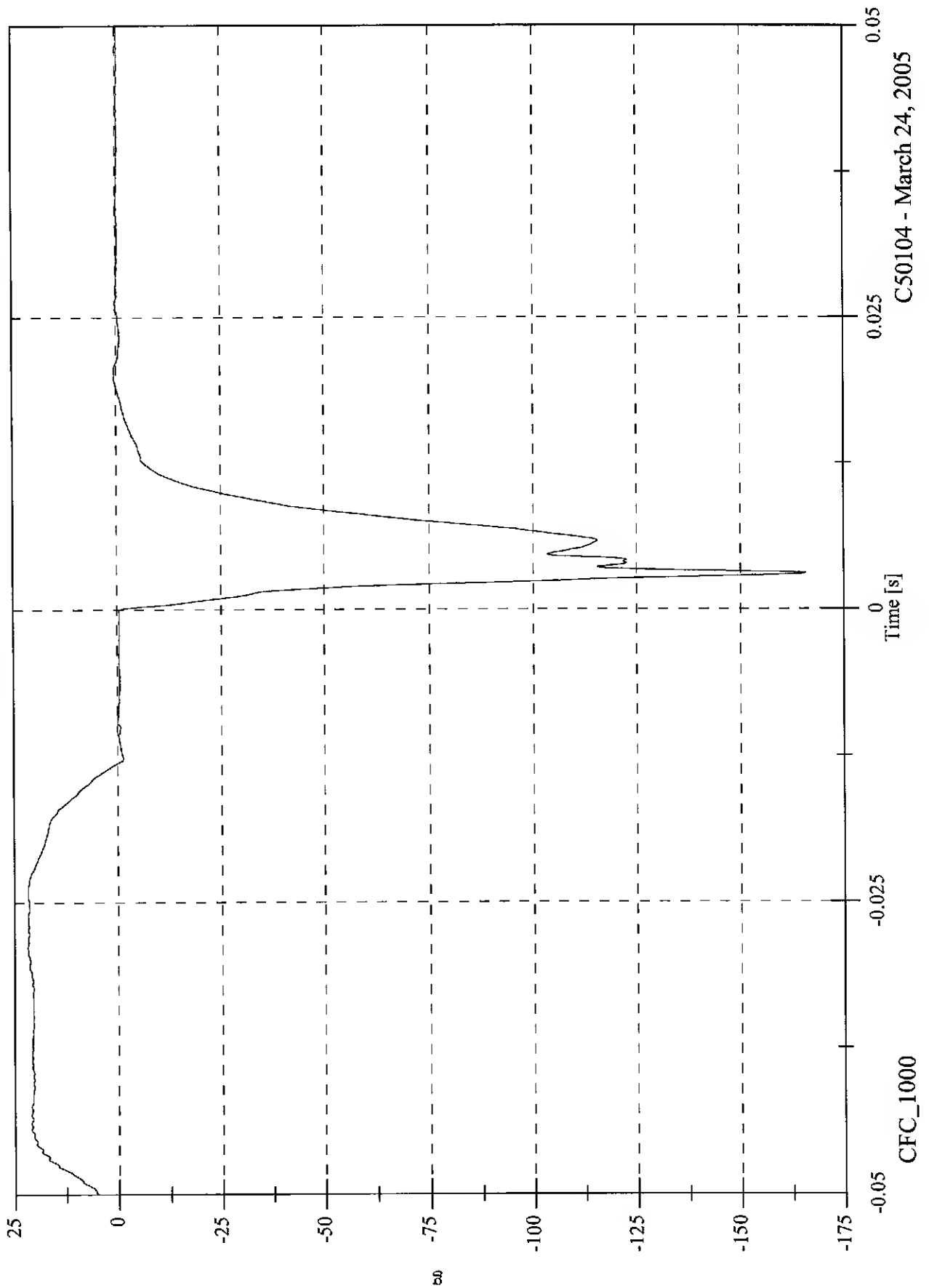
Headform Resultant

Min: -0.0 [g] at -0.100 [s]



FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse
Headform X Acceleration

Max: 21.8 [g] at -0.029 [s]
Min: -165.9 [g] at 0.003 [s]



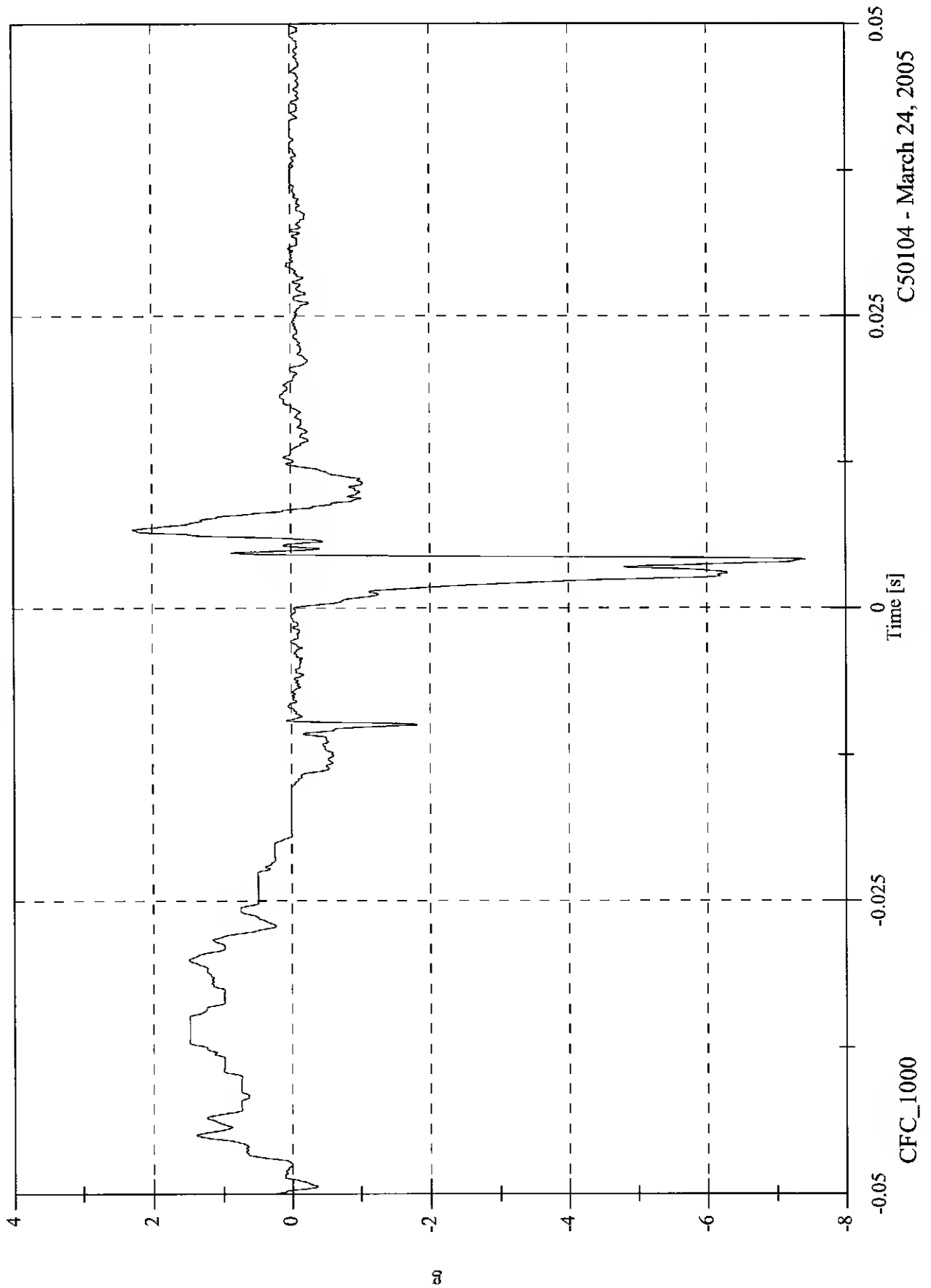
C50104 - March 24, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Y Acceleration

Max: 2.3 [g] at 0.007 [s]

Min: -7.4 [g] at 0.004 [s]



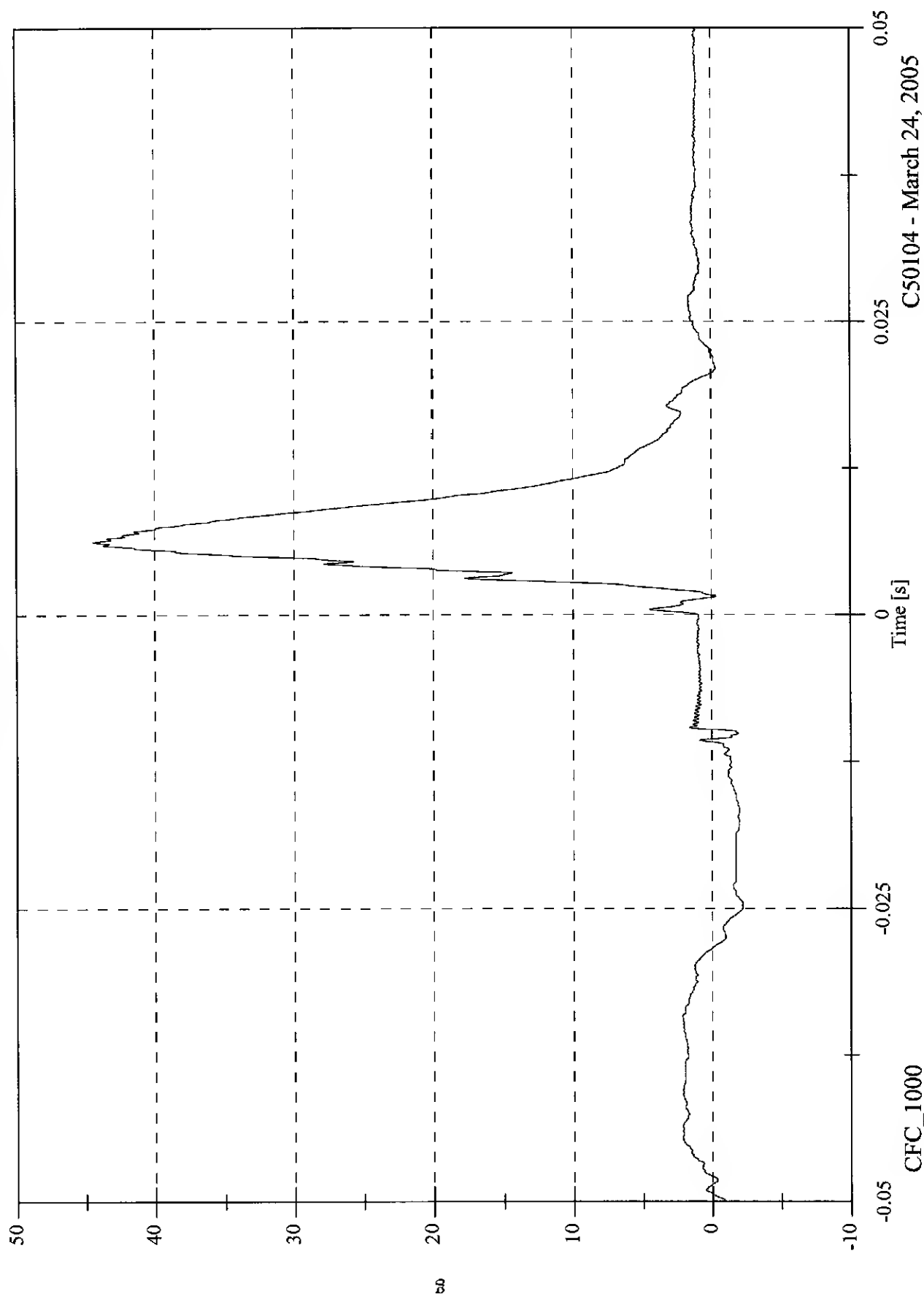
C50104 - March 24, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Z Acceleration

Max: 44.4 [g] at 0.006 [s]

Min: -2.2 [g] at -0.025 [s]



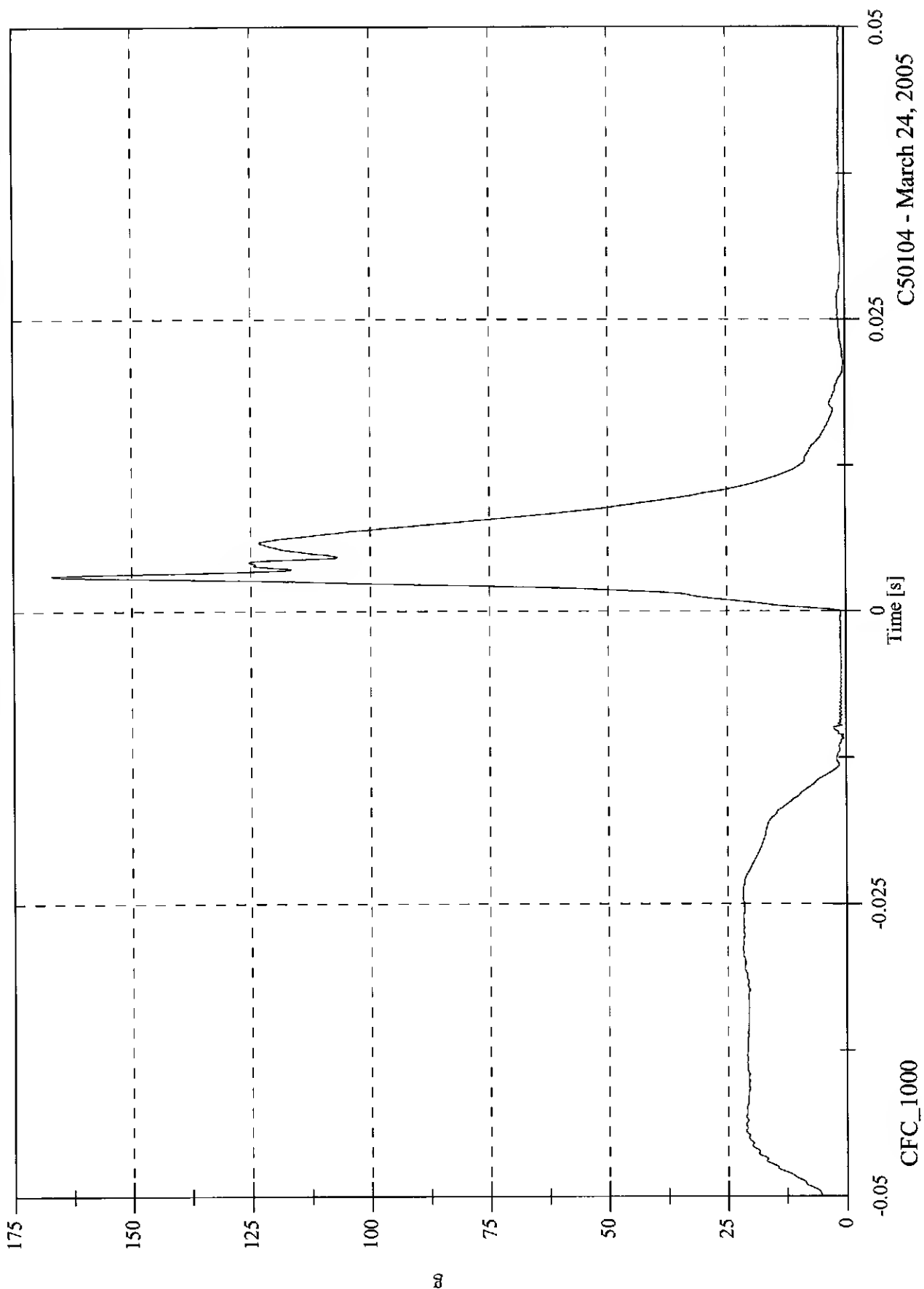
C50104 - March 24, 2005

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Resultant

Max: 166.9 [g] at 0.003 [s]

Min: 0.4 [g] at 0.021 [s]

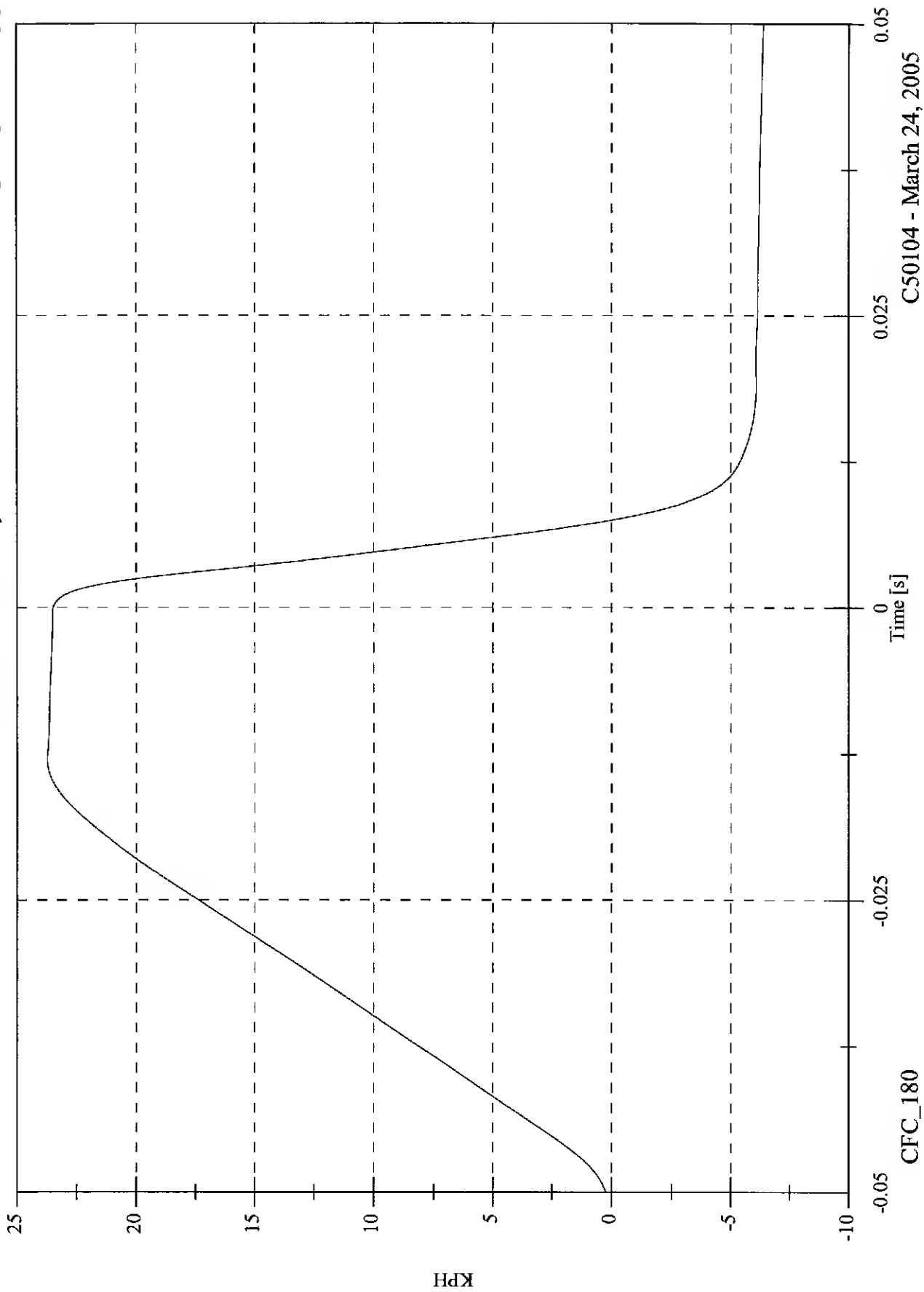


C50104 - March 24, 2005

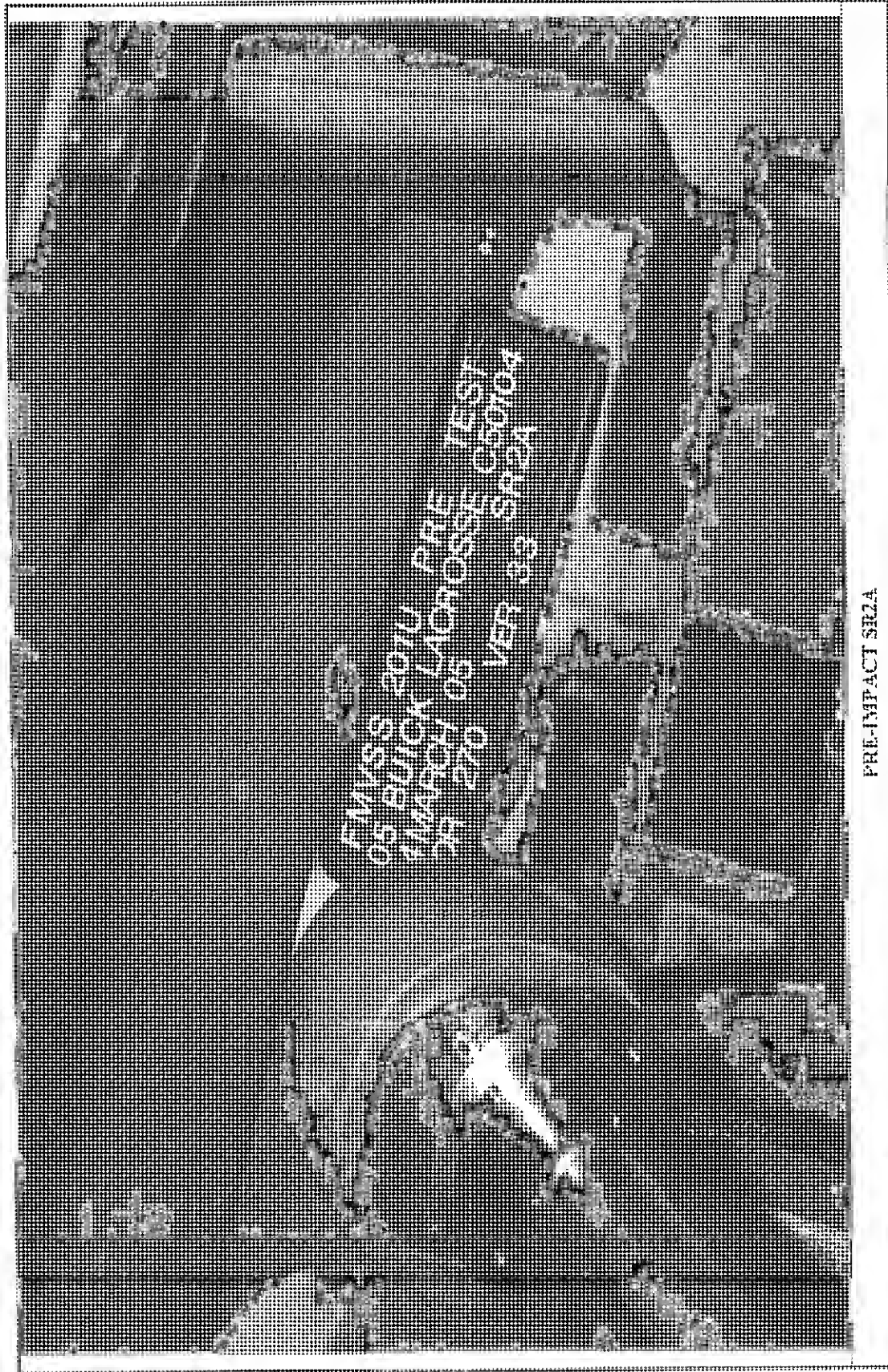
Max: 23.7 [KPH] at -0.013 [s]
Min: -6.4 [KPH] at 0.050 [s]

FMVSS 201U IMPACT TEST - 2005 Buick Lacrosse

Headform Velocity

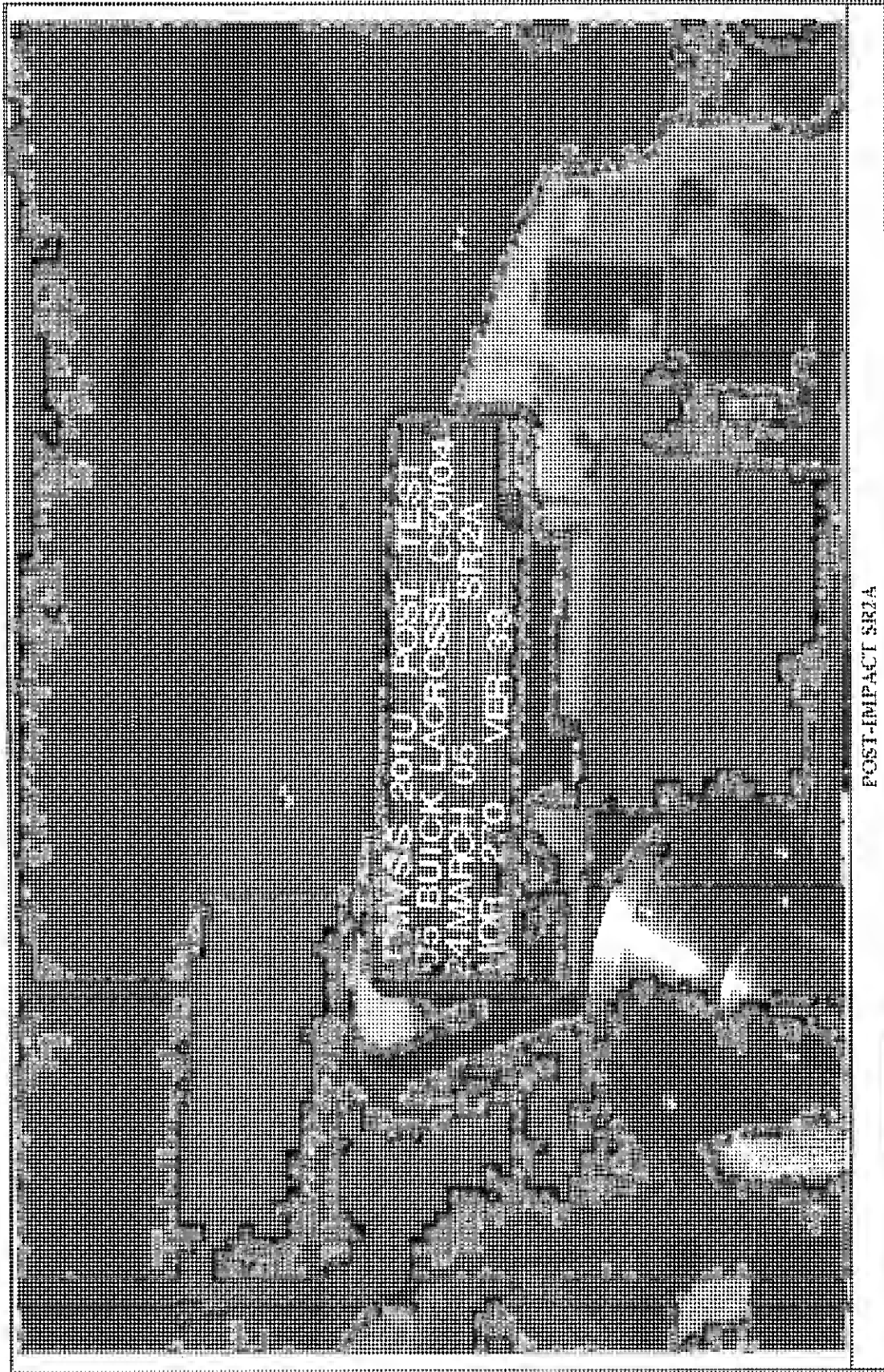


C50104 - March 24, 2005



PRE-IMPACT SR24

8784-FME-01



POST-IMPACT SR1A

8754-FVH-04

APPENDIX A

PHOTOGRAPHS

PHOTOGRAPHS

FIGURE	VIEW
A-1	LEFT SIDE VIEW OF VEHICLE
A-2	RIGHT SIDE VIEW OF VEHICLE
A-3	3/4 FRONTAL VIEW FROM LEFT SIDE OF VEHICLE
A-4	3/4 REAR VIEW FROM RIGHT SIDE OF VEHICLE
A-5	VEHICLE'S CERTIFICATION LABEL
A-6	VEHICLE'S TIRE INFORMATION LABEL
A-7	PRE-TEST DRIVER SIDE A-PILLAR
A-8	PRE-TEST DRIVER SIDE FRONT HEADER
A-9	PRE-TEST DRIVER SIDE SIDE RAIL
A-10	PRE-TEST DRIVER SIDE B-PILLAR
A-11	PRE-TEST DRIVER SIDE REAR PILLAR
A-12	PRE-TEST PASSENGER SIDE A-PILLAR
A-13	PRE-TEST PASSENGER SIDE FRONT HEADER
A-14	PRE-TEST PASSENGER SIDE SIDE RAIL
A-15	PRE-TEST PASSENGER SIDE B-PILLAR
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A-17	POST-TEST DRIVER SIDE A-PILLAR
A-18	POST-TEST DRIVER FRONT HEADER
A-19	POST-TEST DRIVER SIDE SIDE RAIL
A-20	POST-TEST DRIVER SIDE B-PILLAR
A-21	POST-TEST DRIVER SIDE REAR PILLAR
A-22	POST-TEST PASSENGER SIDE A-PILLAR
A-23	POST-TEST PASSENGER FRONT HEADER
A-24	POST-TEST PASSENGER SIDE SIDE RAIL
A-25	POST-TEST PASSENGER SIDE B-PILLAR
A-26	POST-TEST PASSENGER SIDE REAR PILLAR

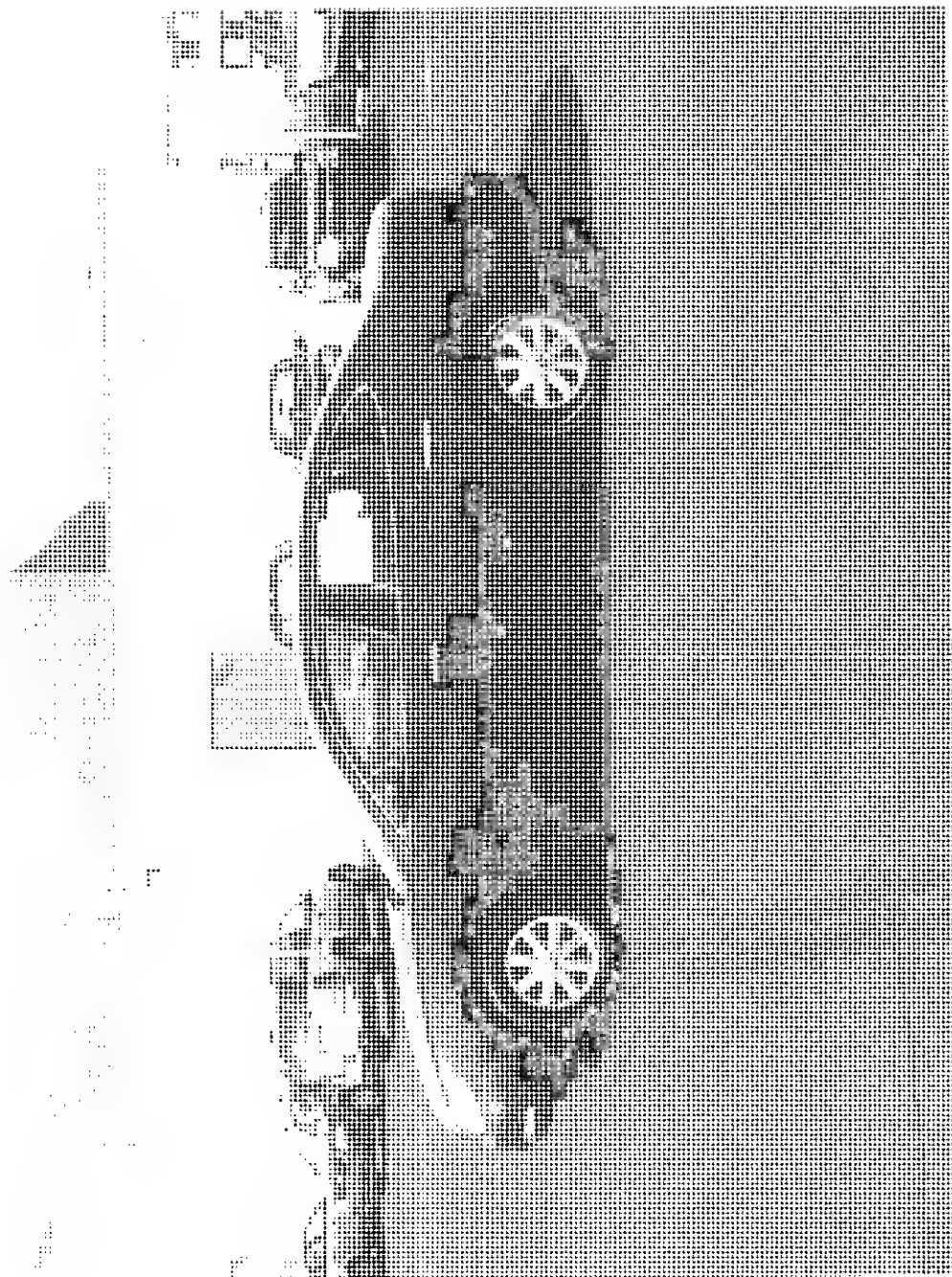


FIGURE A-1: LEFT SIDE VIEW OF VEHICLE

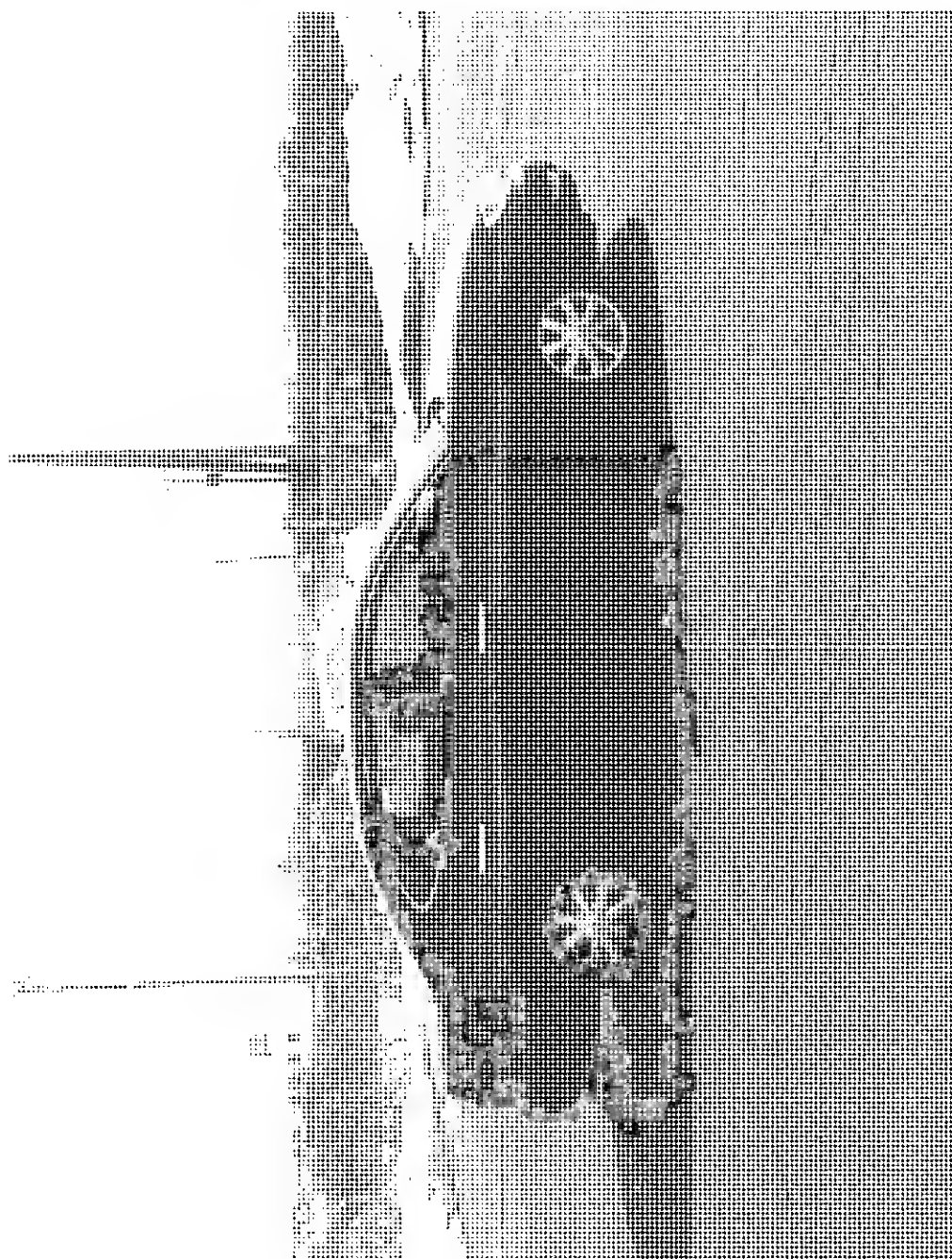


Figure A-2: RIGHT SIDE VIEW OF VEHICLE

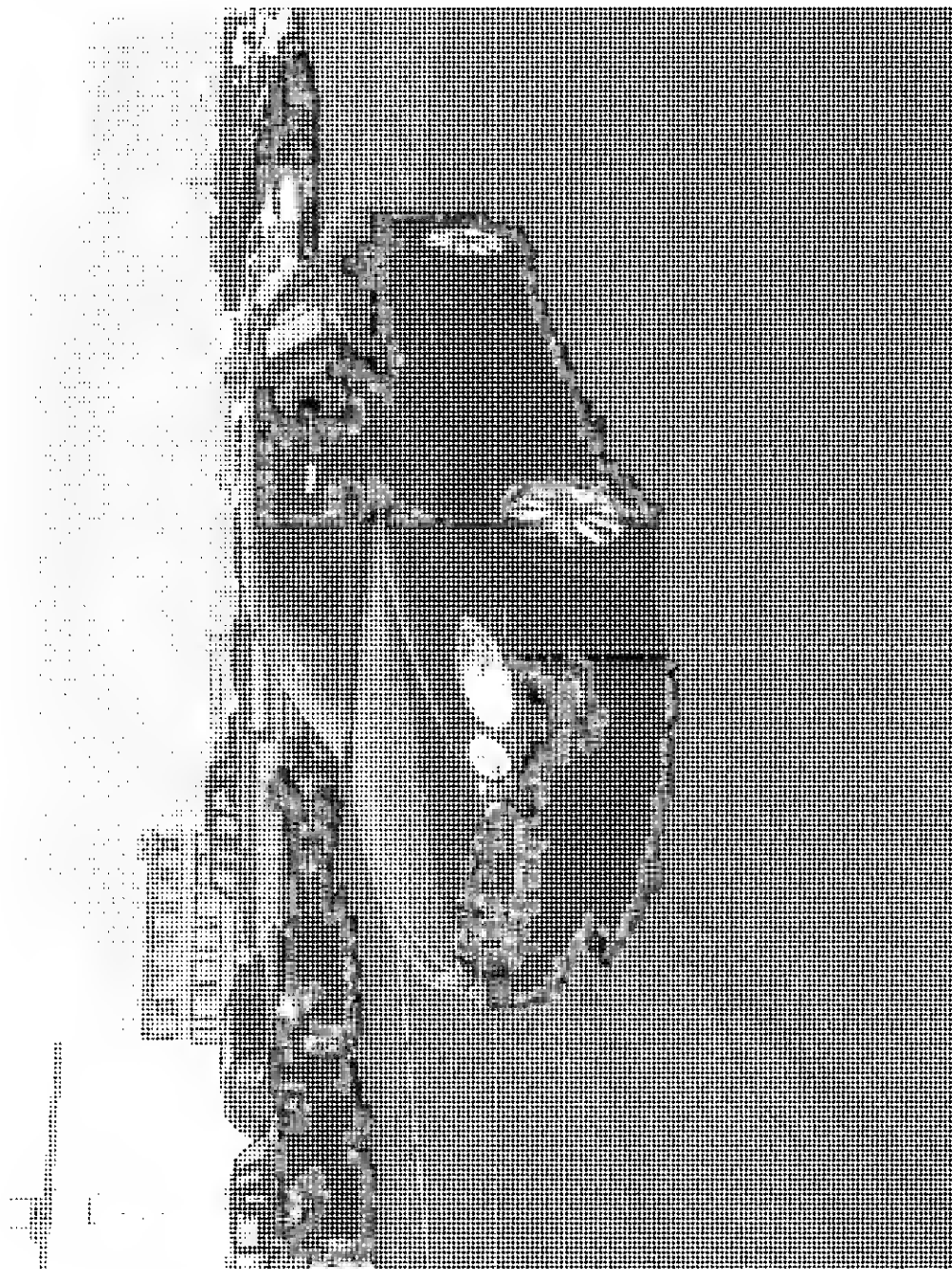


Figure A-5. 34 FRONTAL VIEW FROM LEFT SIDE OF VEHICLE

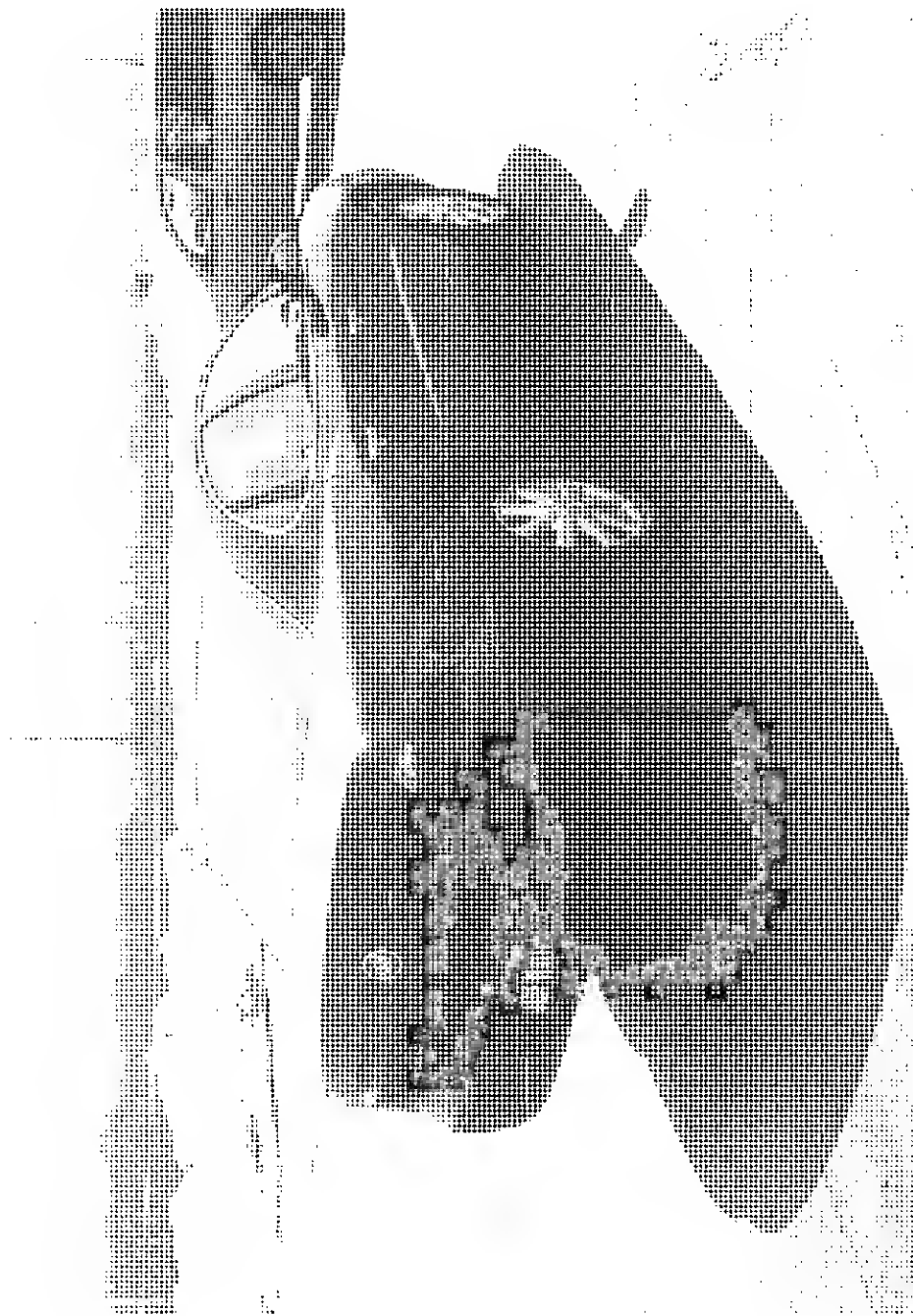


Figure A-4 : 3/4 REAR VIEW FROM RIGHT SIDE OF VEHICLE

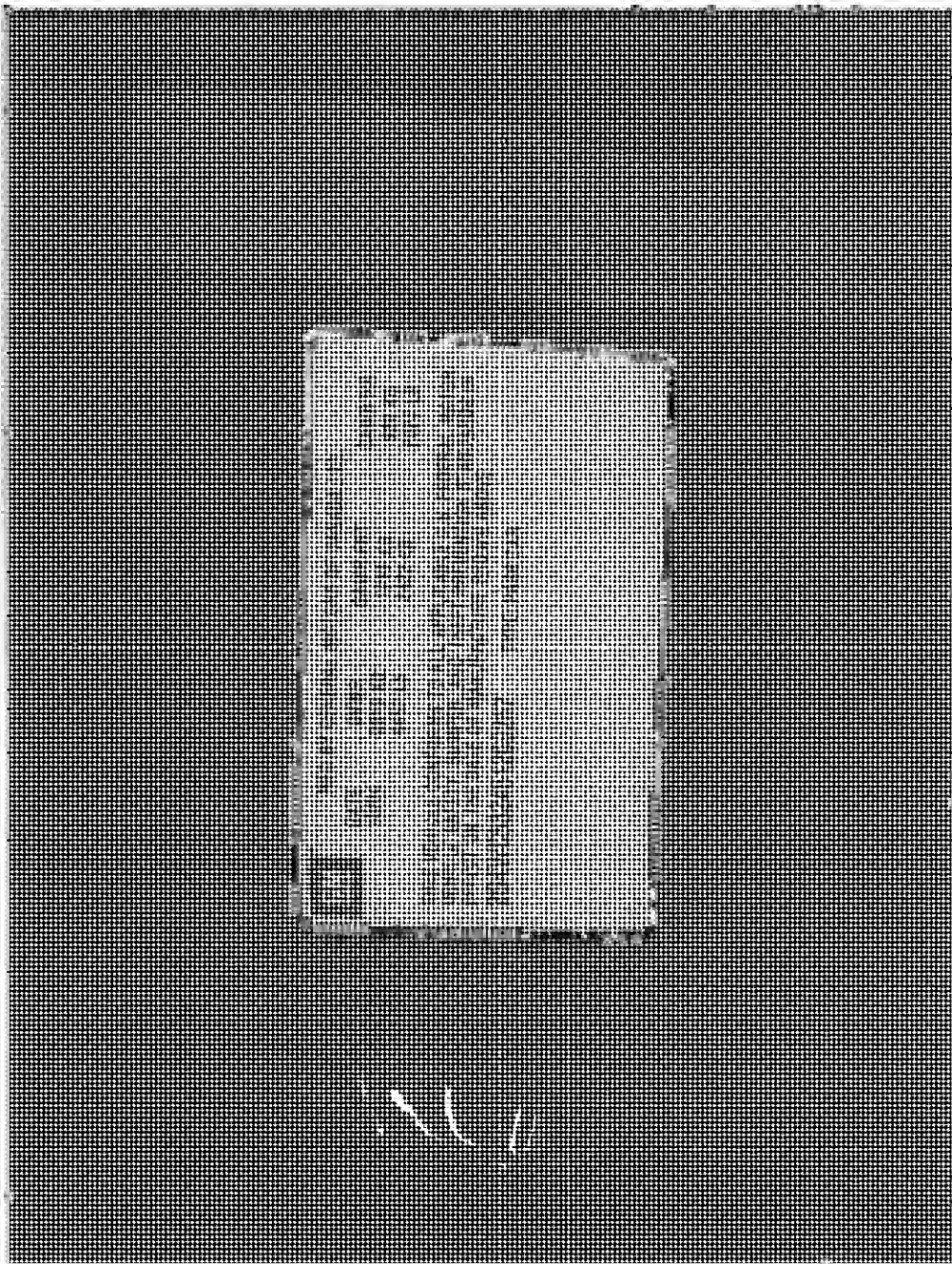


Figure A-5 : VEHICLE'S CERTIFICATION LABEL

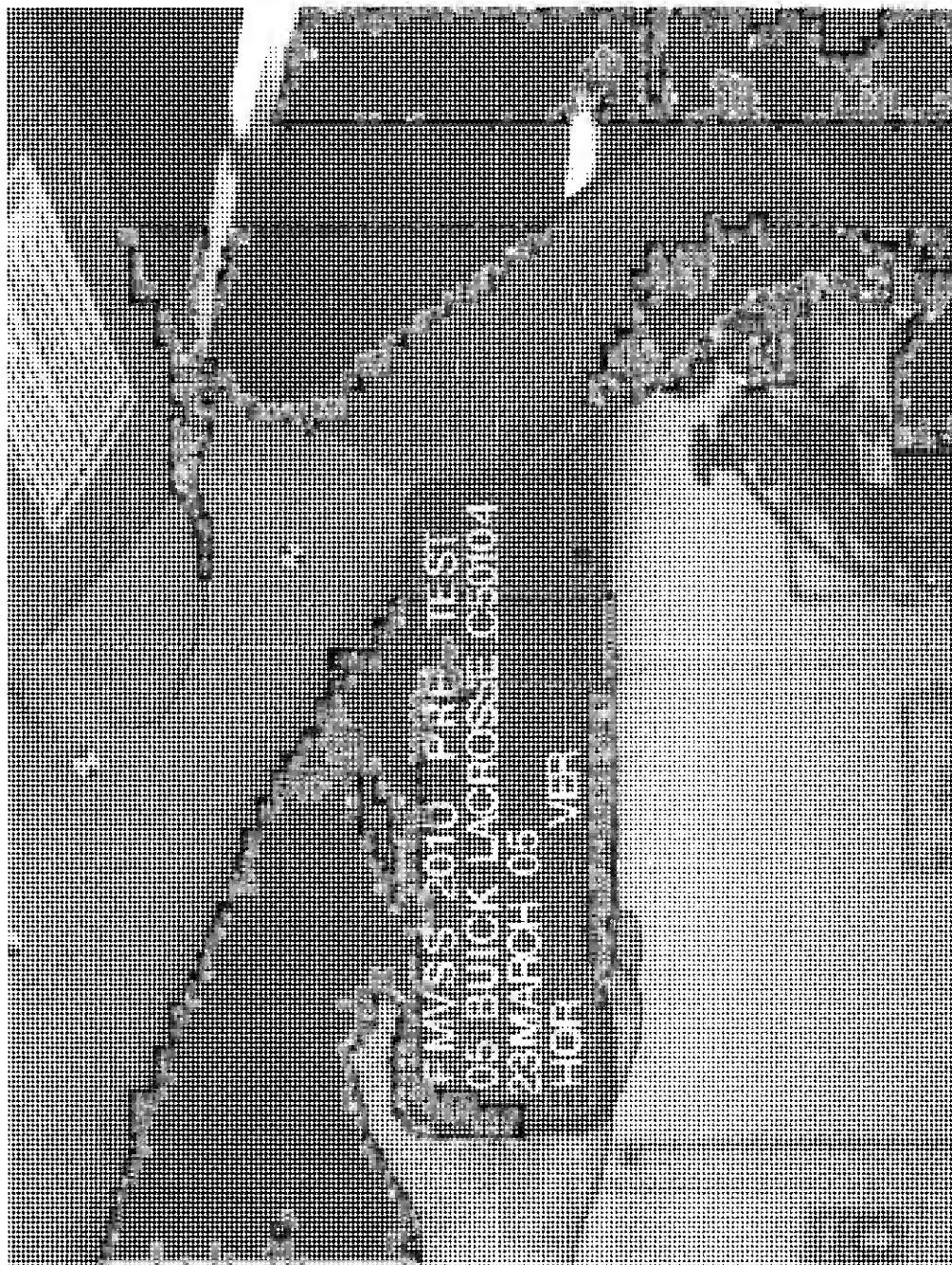


Figure A-7 - PRE-TEST DRIVER SIDE A-PILLAR



Figure A-8: PRE-TEST DRIVER SIDE FRONT HEADER

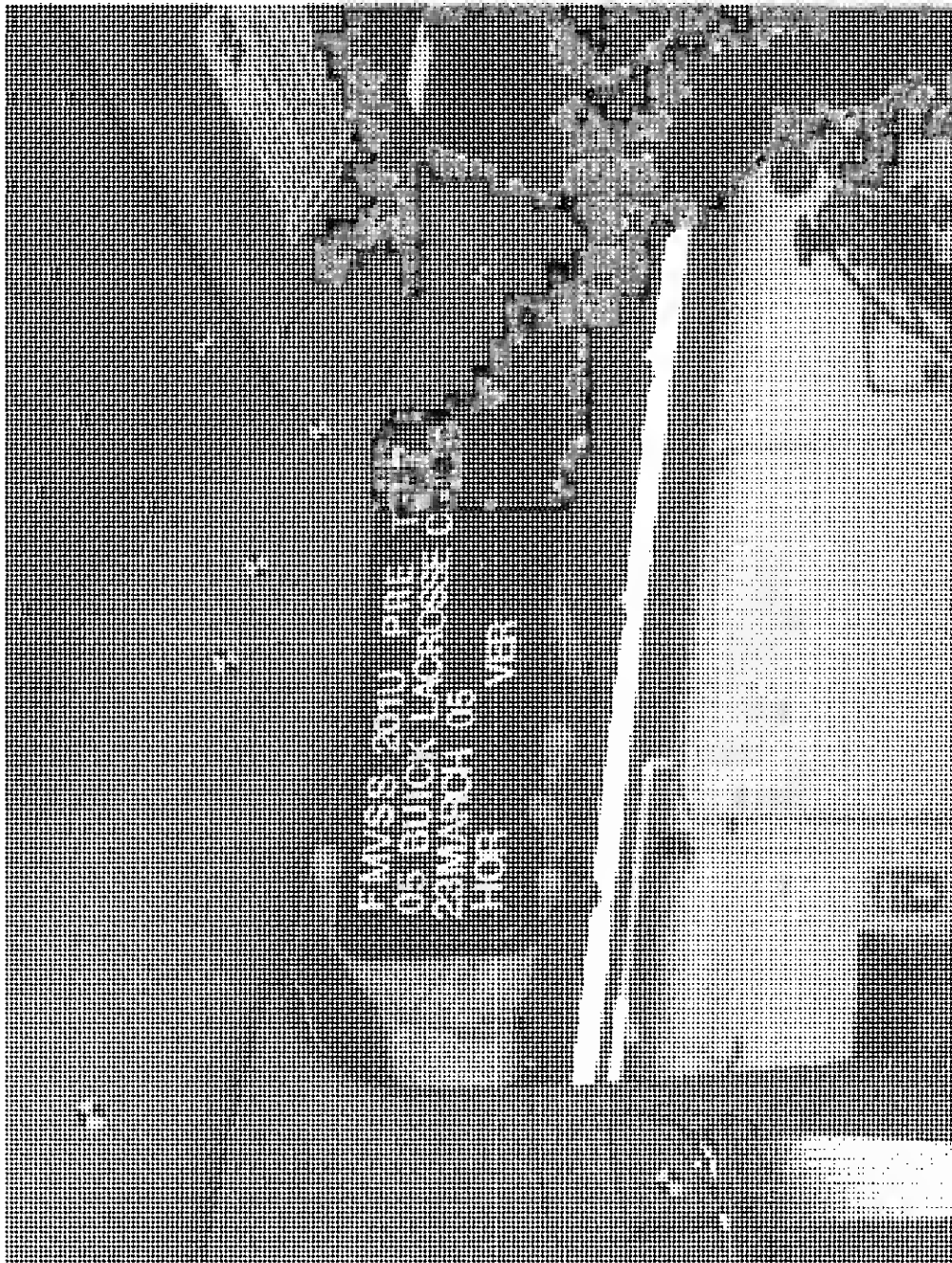


Figure A.9. PRE-TEST DRIVER SIDE SIDE RAIL

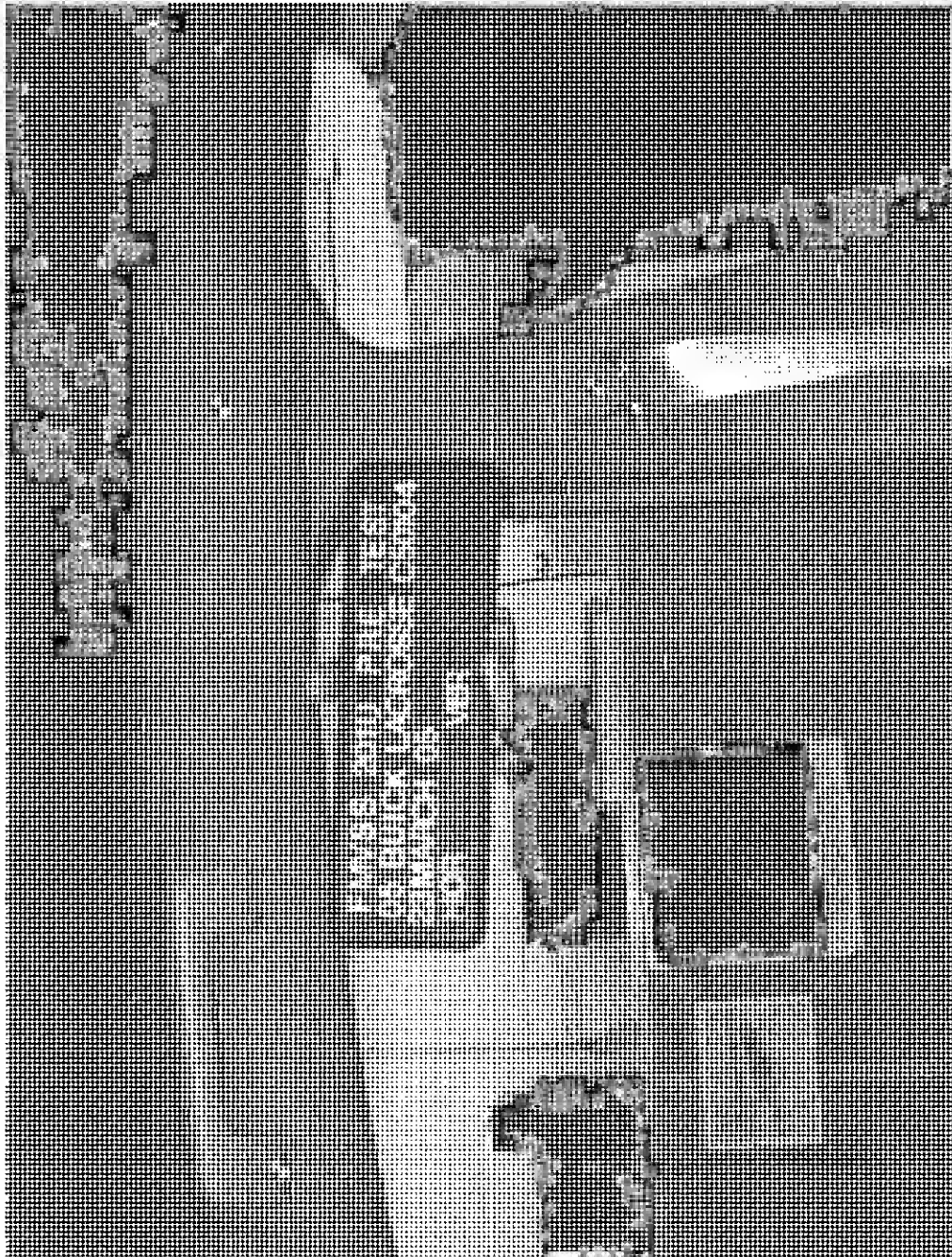


FIGURE A-10: PRE-TEST DRIVER SIDE B-PILLAR

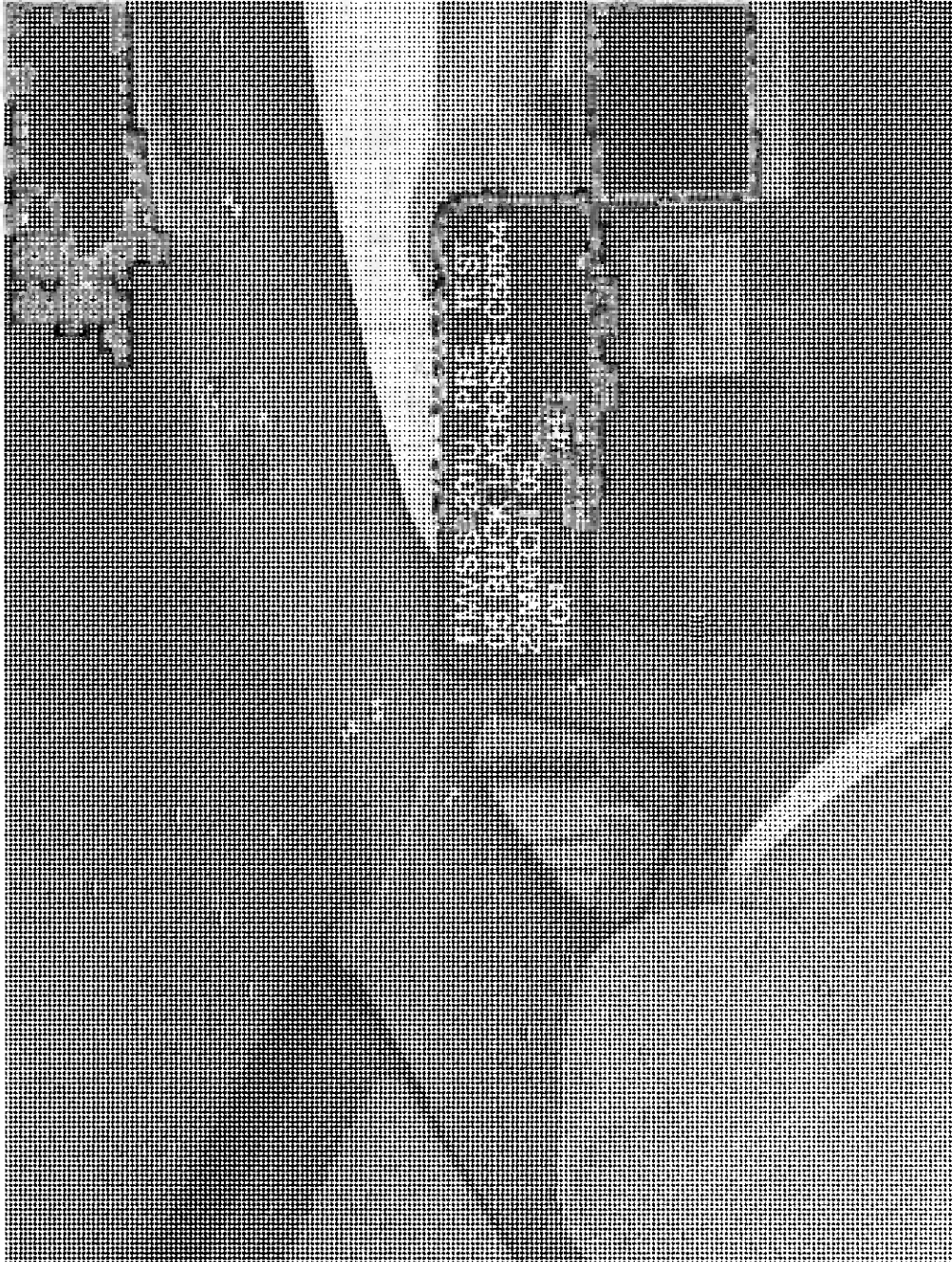


Figure A-11 PRE-TEST DRIVER SIDE REAR PILLAR

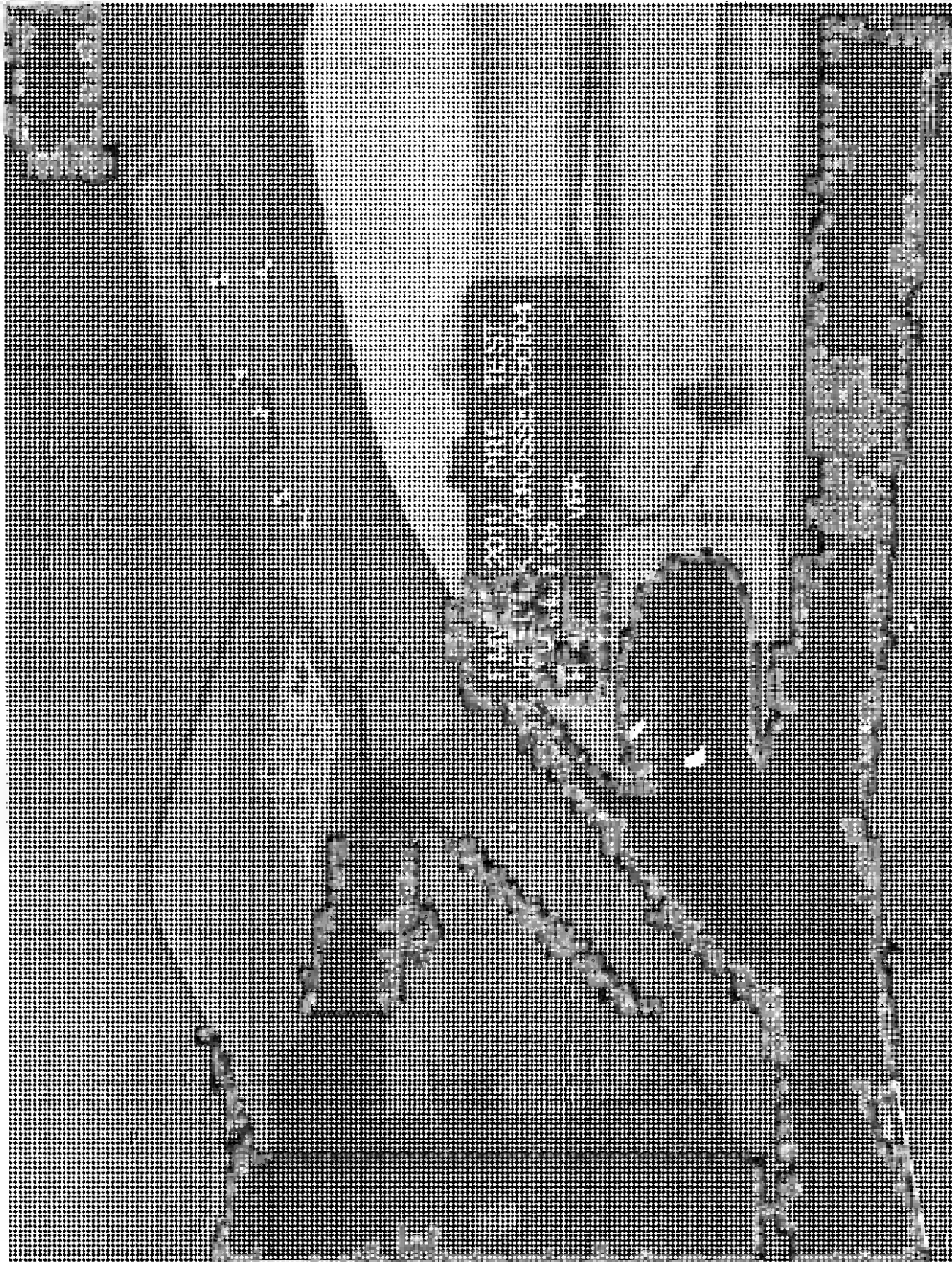


FIGURE A-12: PRE-TEST PASSENGER SIDE A-PILLAR

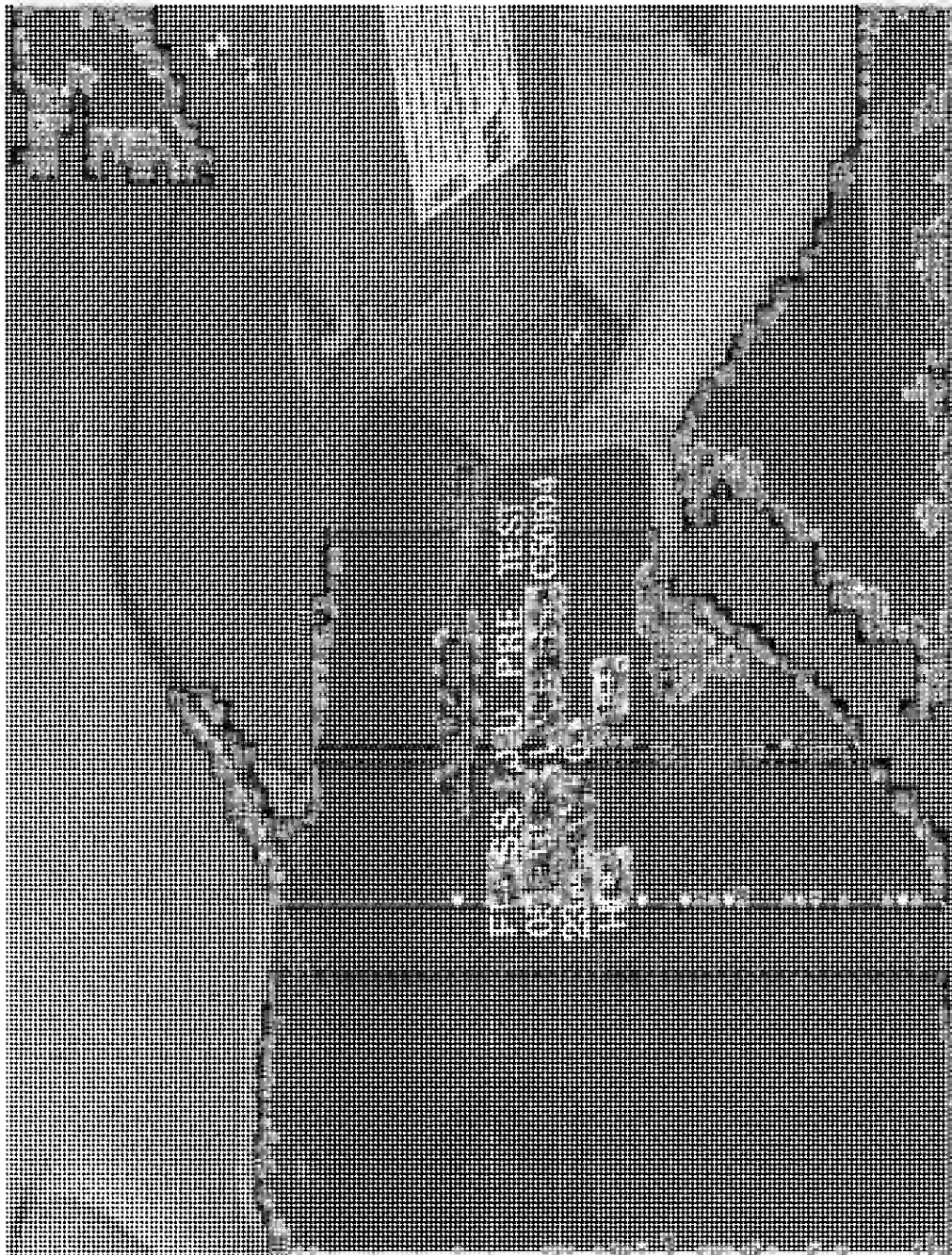


Figure A-13 PRE-TEST PASSENGER SIDE FRONT HEADER

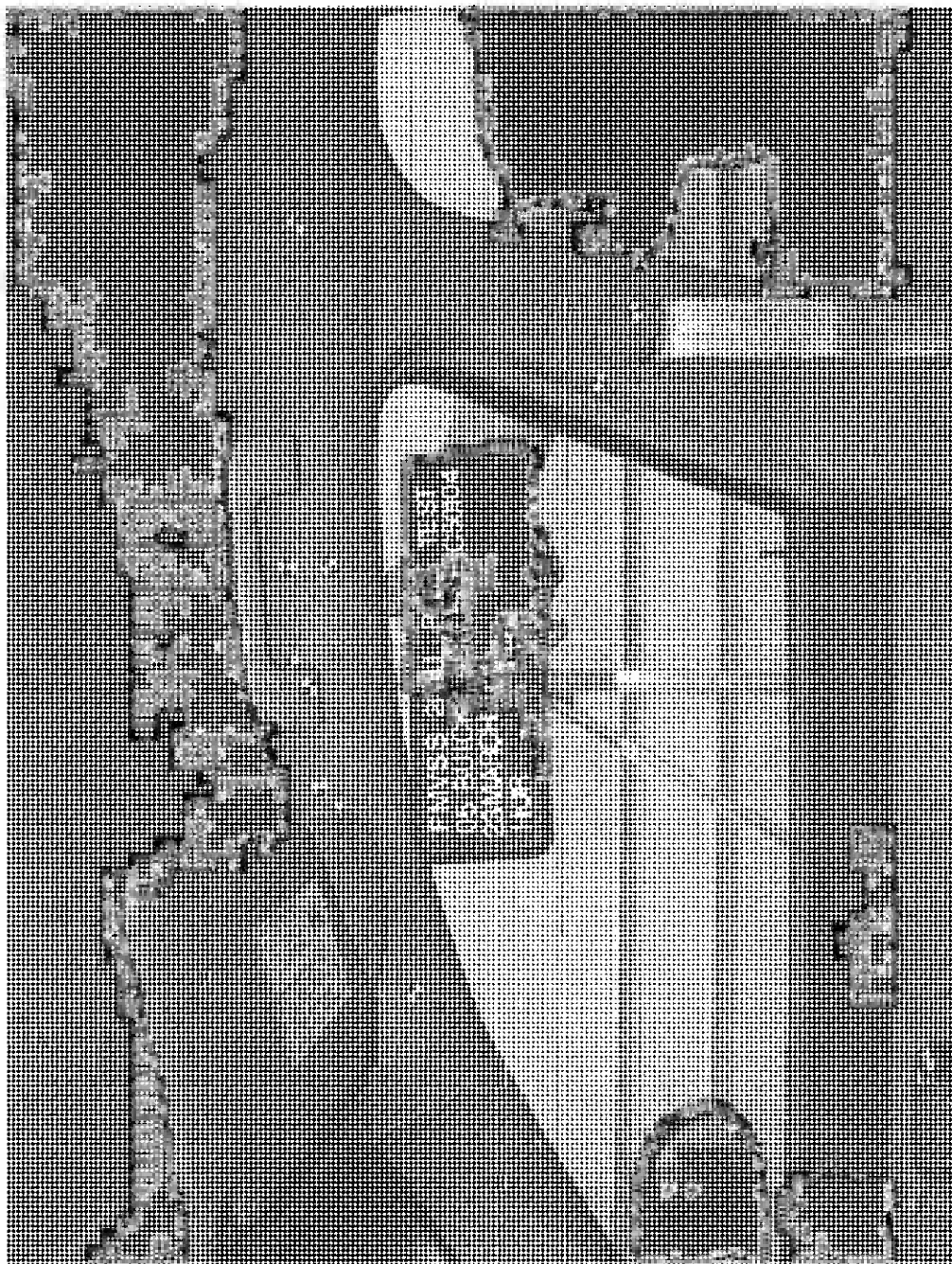


Figure A.14: PRE-TEST PASSENGER SIDE SIDE RAIL

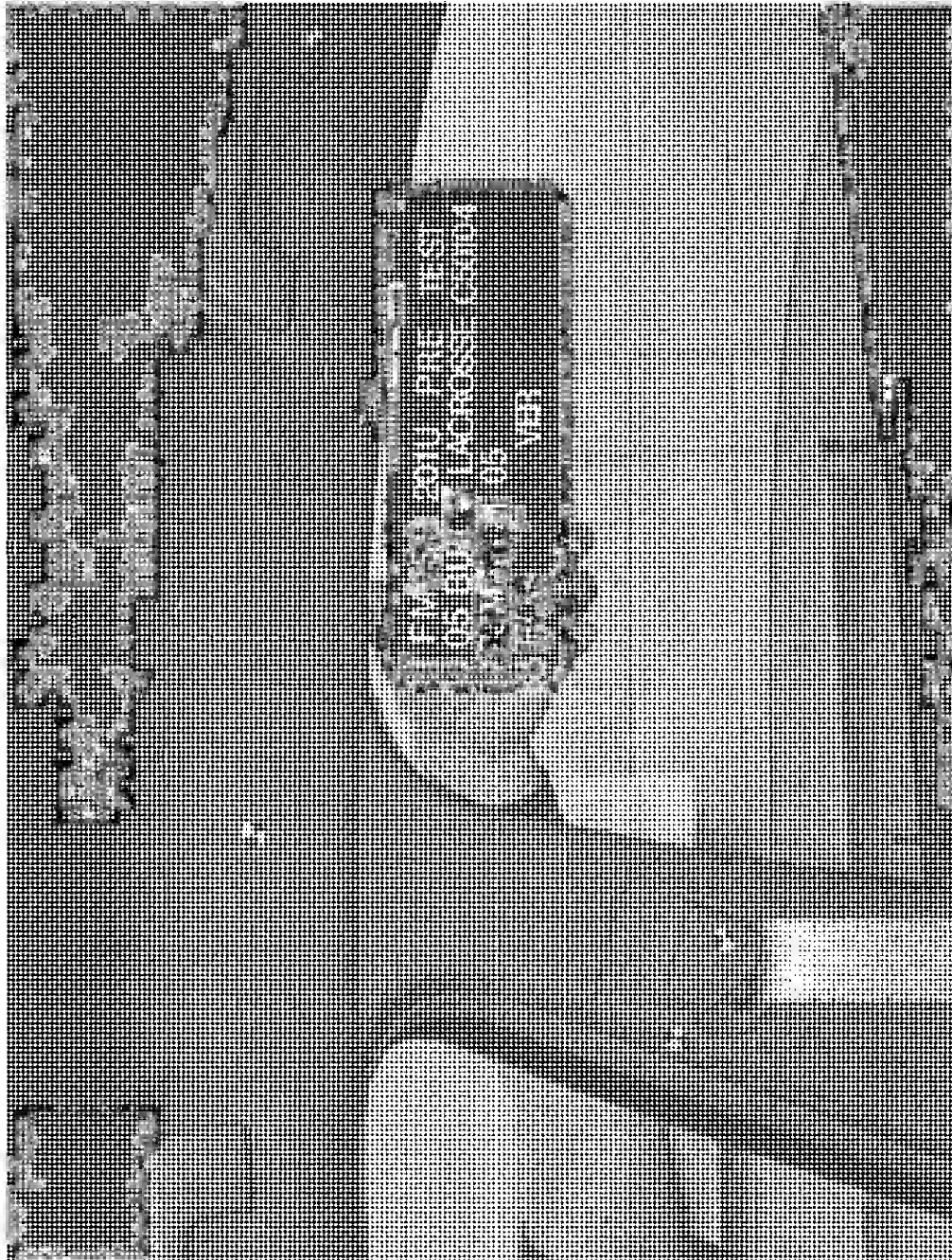


Figure A-15. PRE-TEST PASSENGER SIDE B-PILLAR

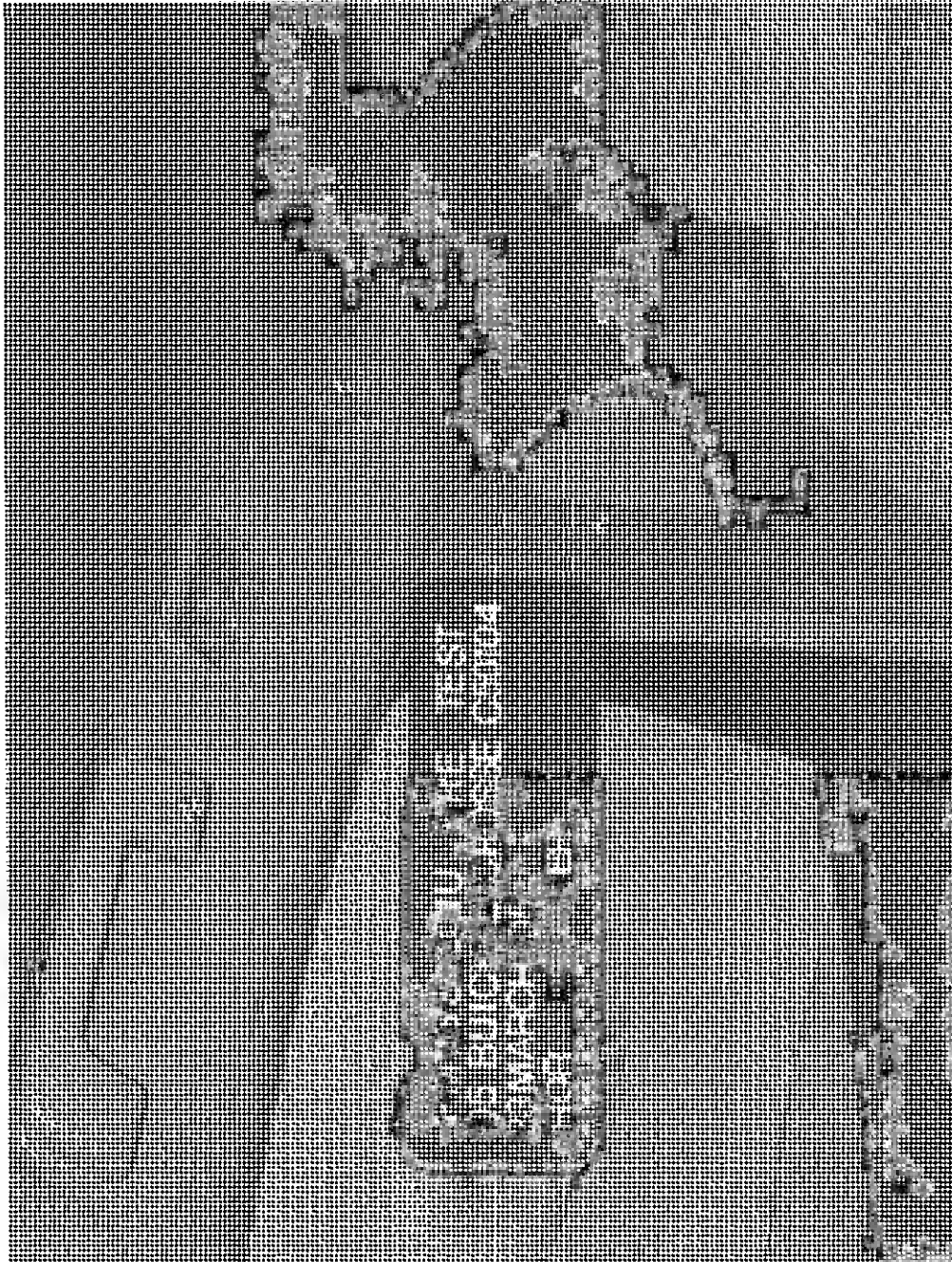


FIGURE A-16: PRE-TEST PASSENGER SIDE REAR PILLAR

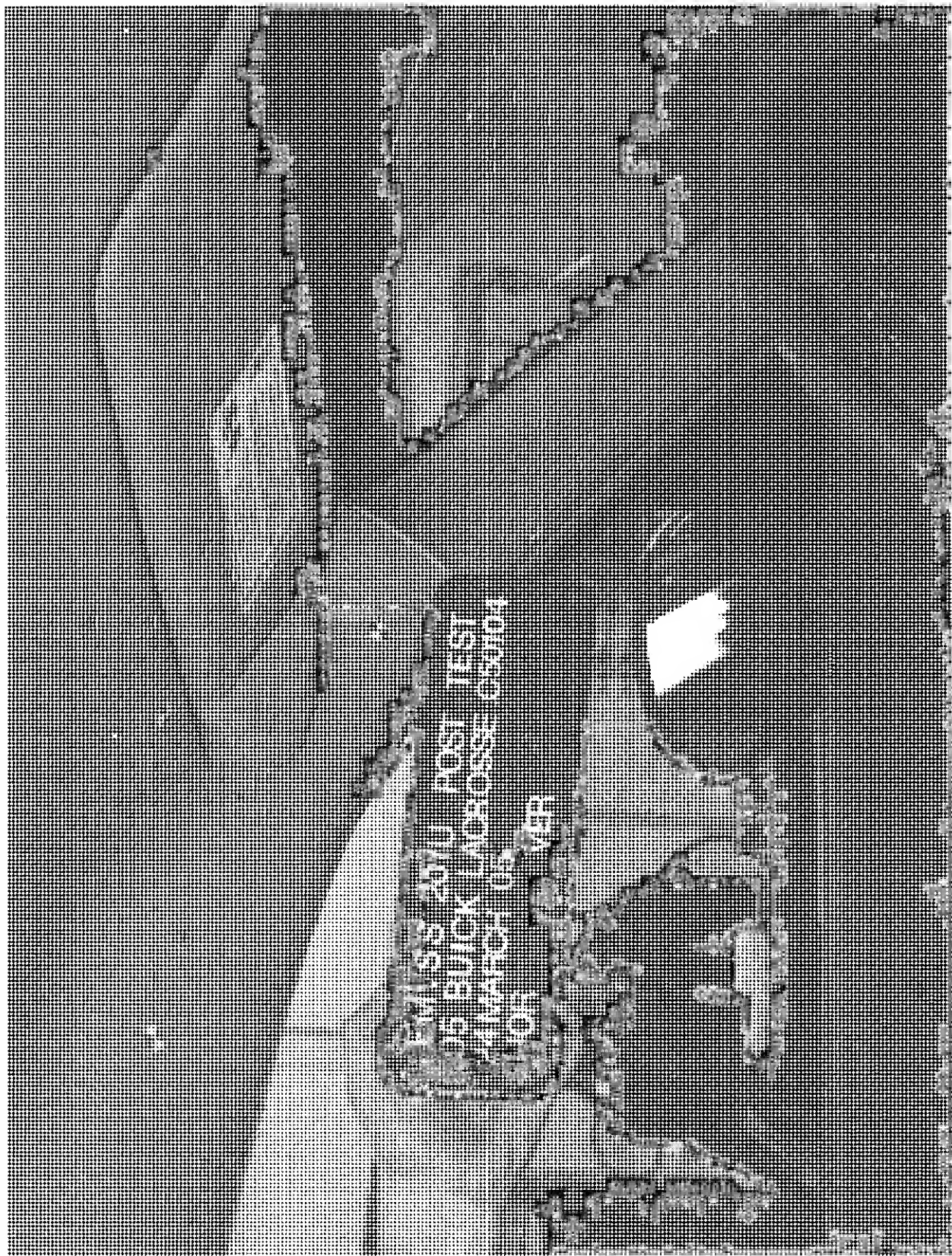


Figure 4-17: POST-TEST DRIVER SIDE A-PILLAR



Figure A-18 - POST TEST DRIVER SIDE FRONT HEADER

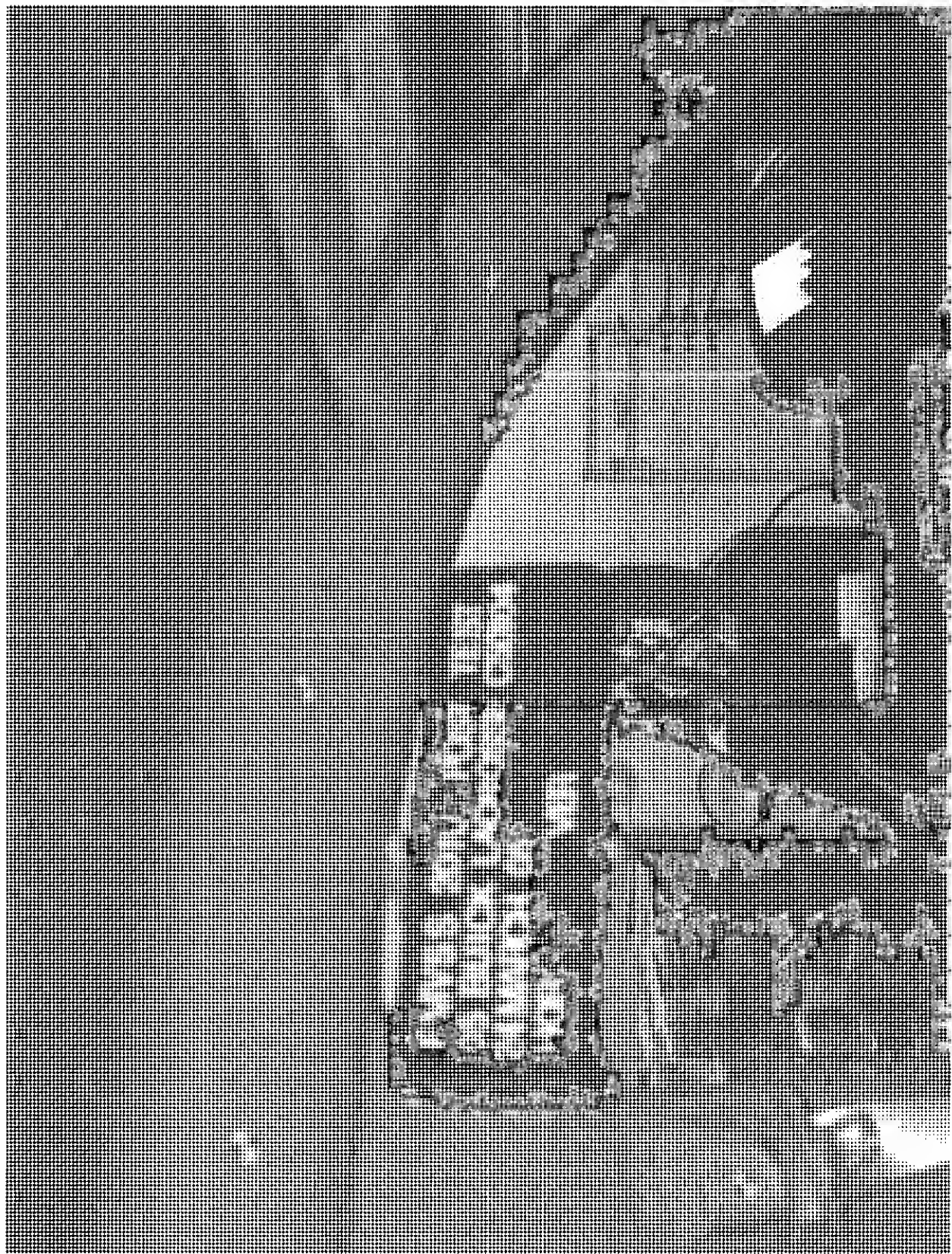


Figure A-15 : POST-TEST DRIVER SIDE SIDE RAIL

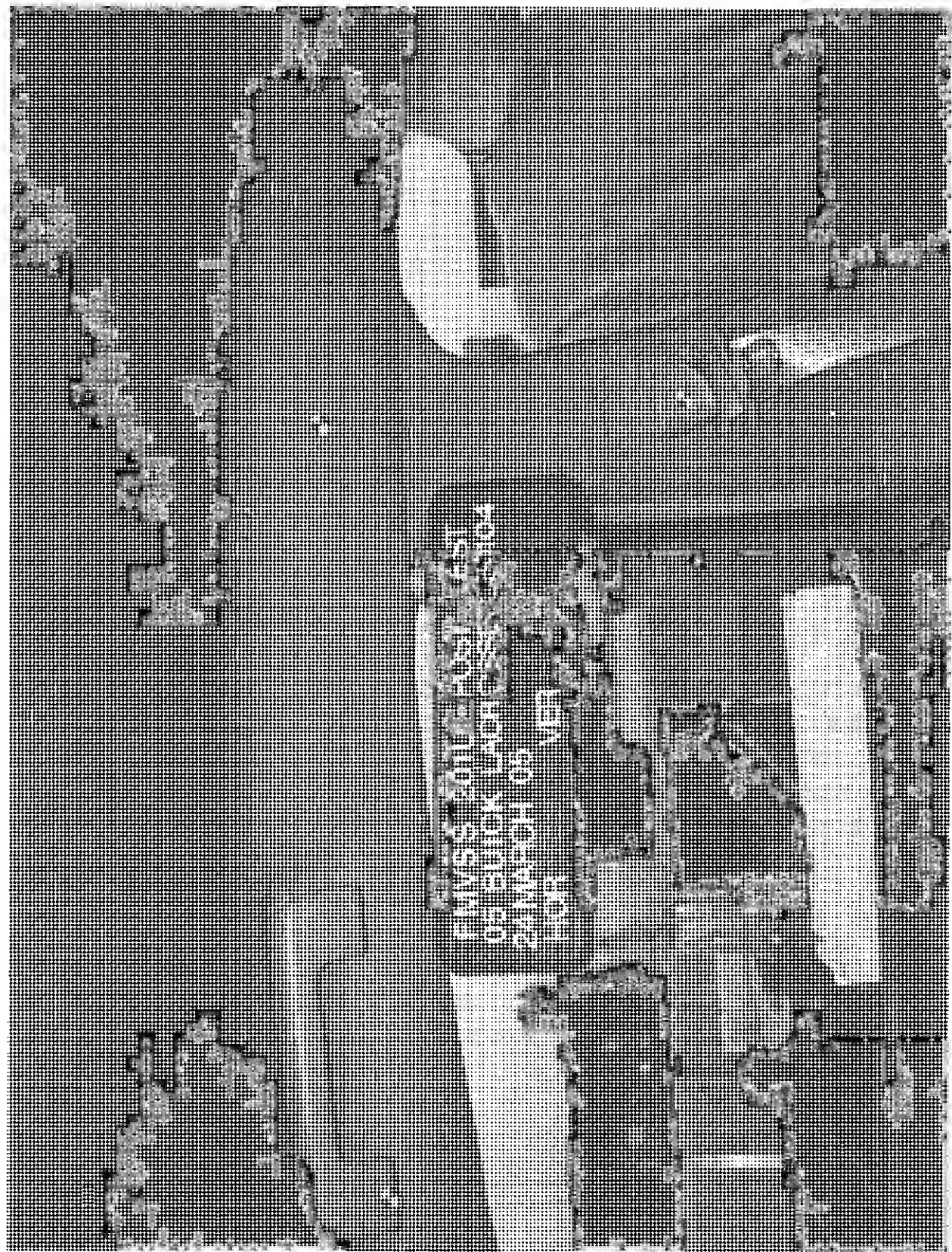


Figure A-20 : POST TEST DRIVER SIDE B-PILLAR



Figure A-21 - POST-TEST DRIVER SIDE REAR PILLAR

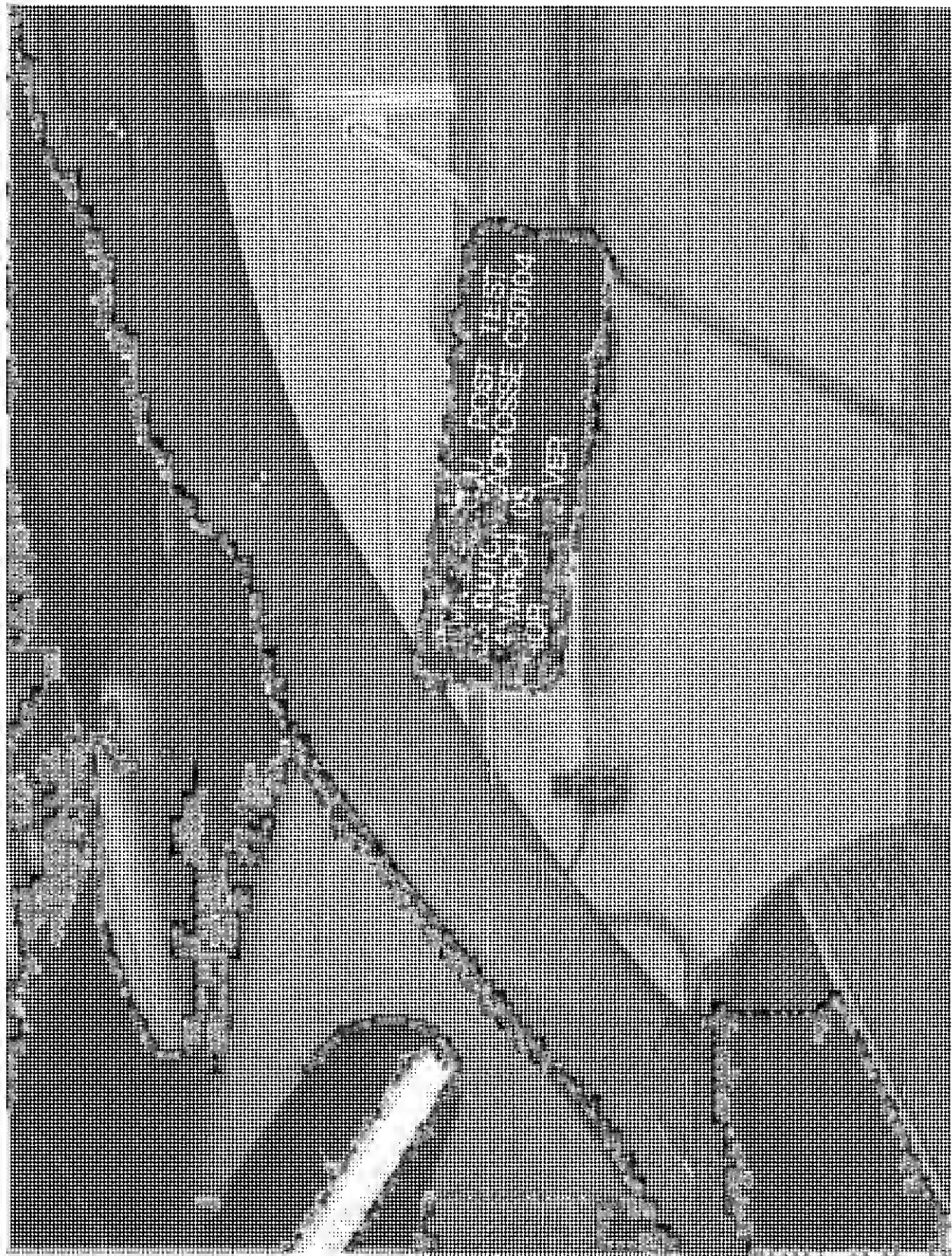


Figure A-22 - POST-TEST PASSENGER SIDE A-PILLAR

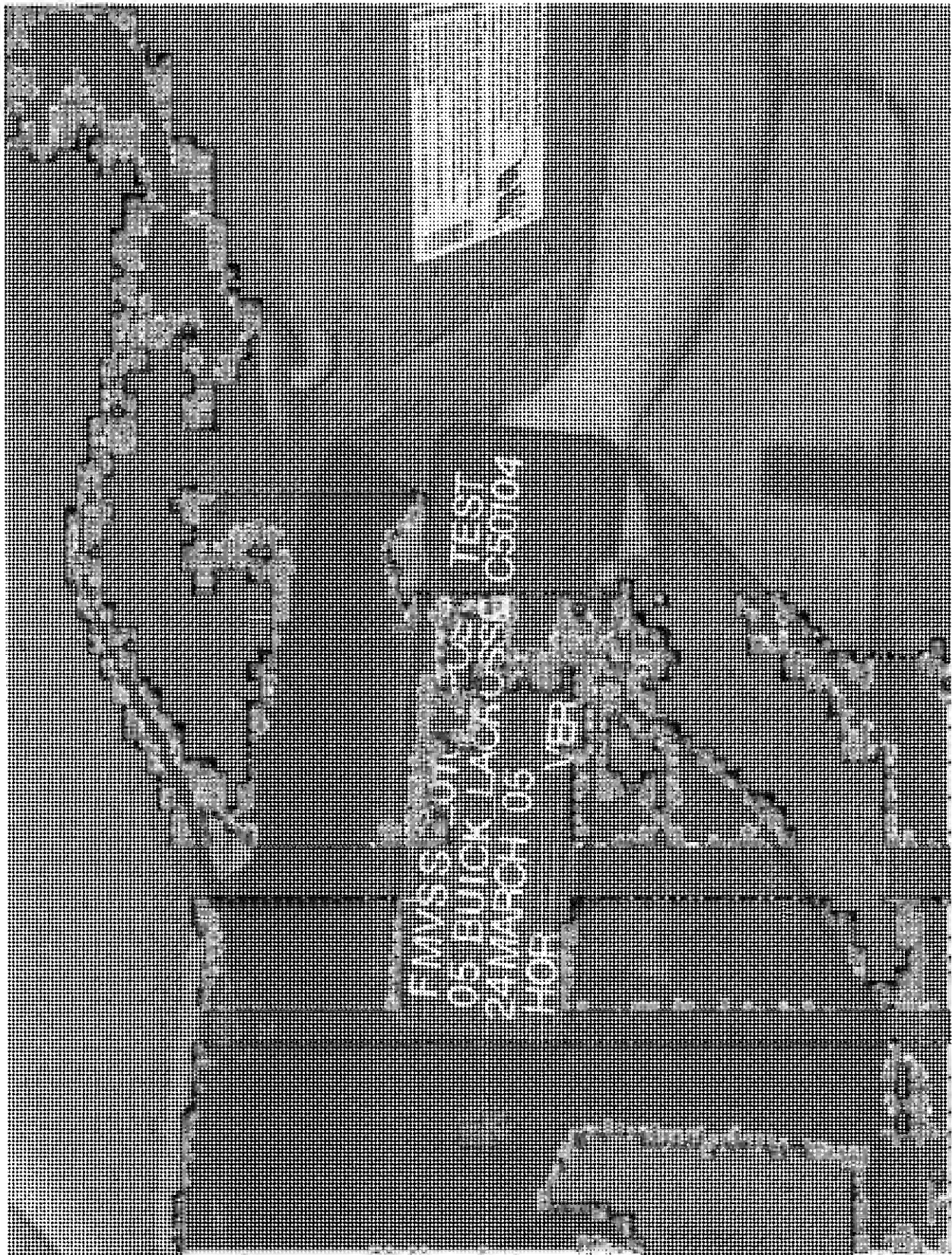


Figure A-23 : POST-TEST PASSENGER SIDE FRONT HEADER

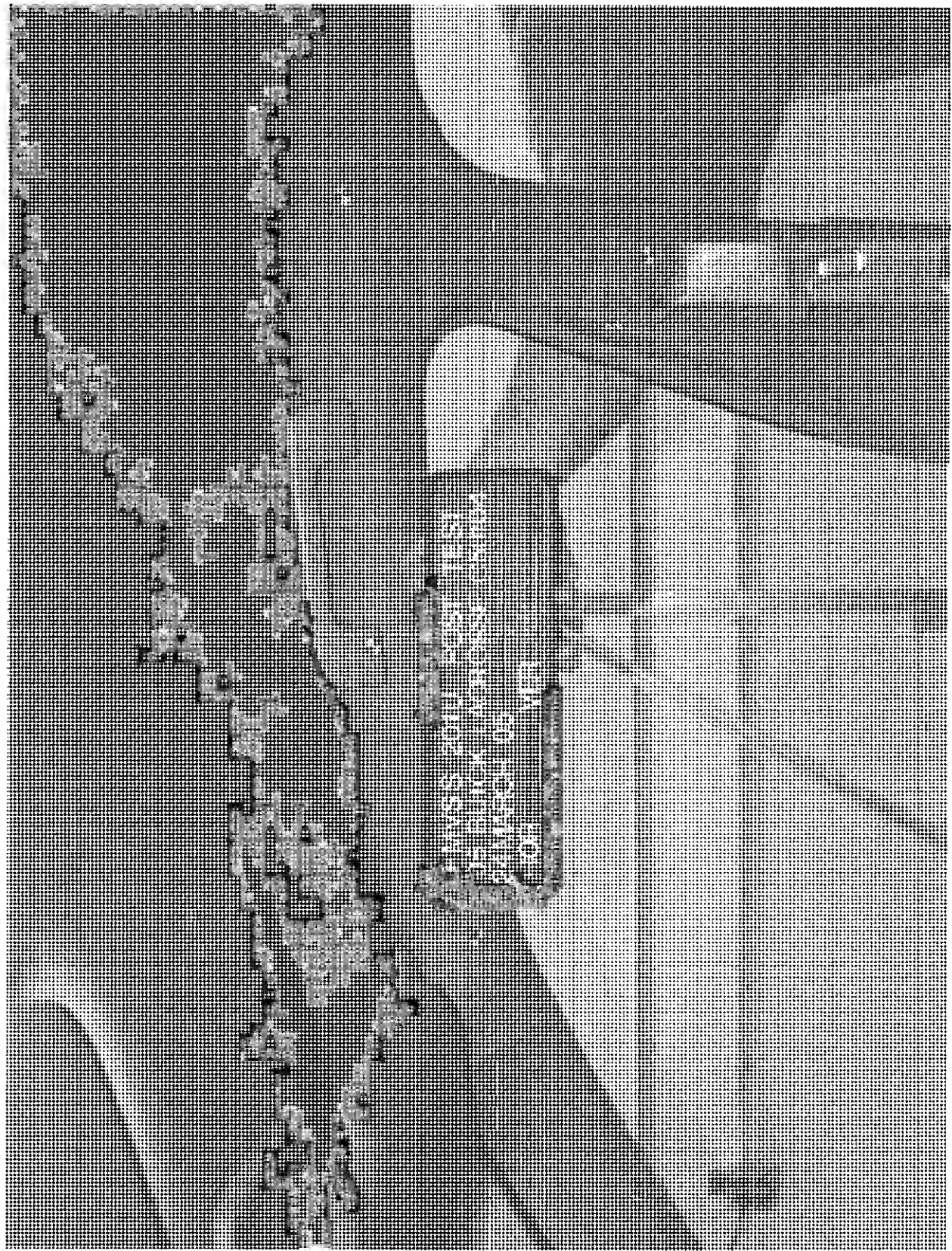


Figure A-24: POST-TEST PASSENGER SIDE SIDE RAIL

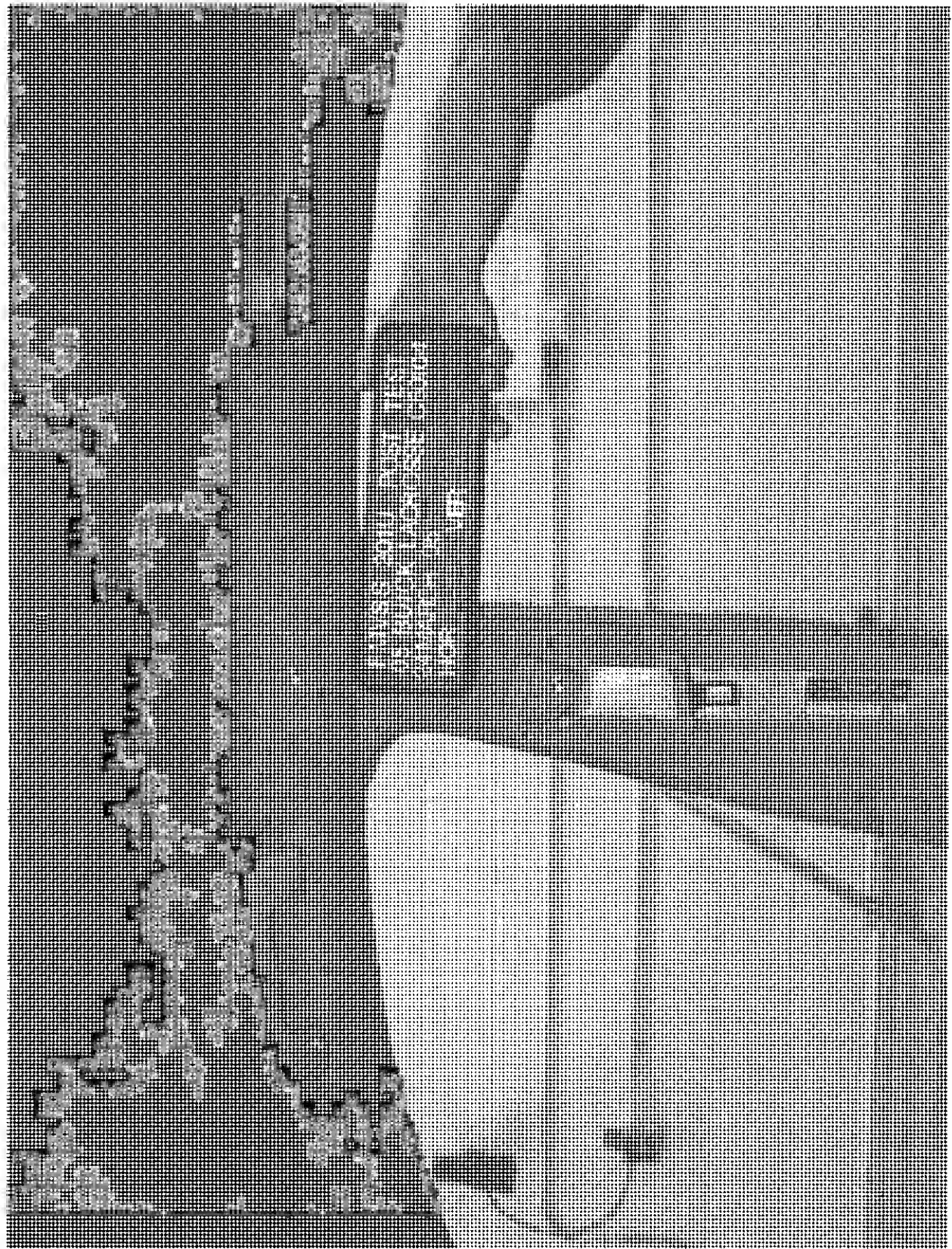


Figure A-25 : POST-TEST PASSENGER SIDE B-PILLAR



Figure A-26. POST-TEST PASSENGER SIDE REAR PILLAR

APPENDIX B

PART 572L PERFORMANCE CALIBRATION IN SUPPORT OF VEHICLE SAFETY COMPLIANCE TESTING FOR OCCUPANT PROTECTION IN INTERIOR IMPACT

Appendix B contains the results from certification tests performed on the Free Motion Headforms utilized in this test program. The results indicate that the headforms meet all of the performance specifications given in 49 CFR Part 572 Subpart L.

The tests were conducted at the Dummy Certification Test Facility of Calspan Corporation. A summary of the test results are included in this Appendix.

**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:		FIRST TECHNOLOGIES SAFETY SYSTEMS	
SERIAL NUMBER:		0642	
CALIBRATION DATE:		March 10, 2005	
TEST PARAMETER	SPECIFICATION	TEST RESULTS	
TEMPERATURE	19°C to 26°C	21.7	
RELATIVE HUMIDITY	10% to 70%	32	
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	254.5	
PEAK LATERAL ACCELERATION	15 Gs Maximum	10.4	
IS ACCELERATION CURVE UNIMODAL?	YES	YES	

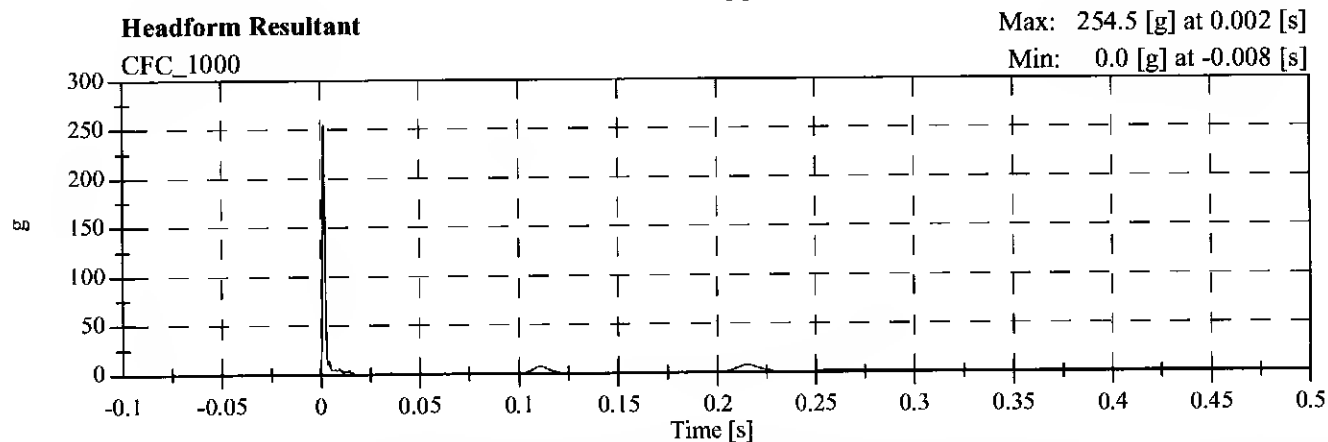
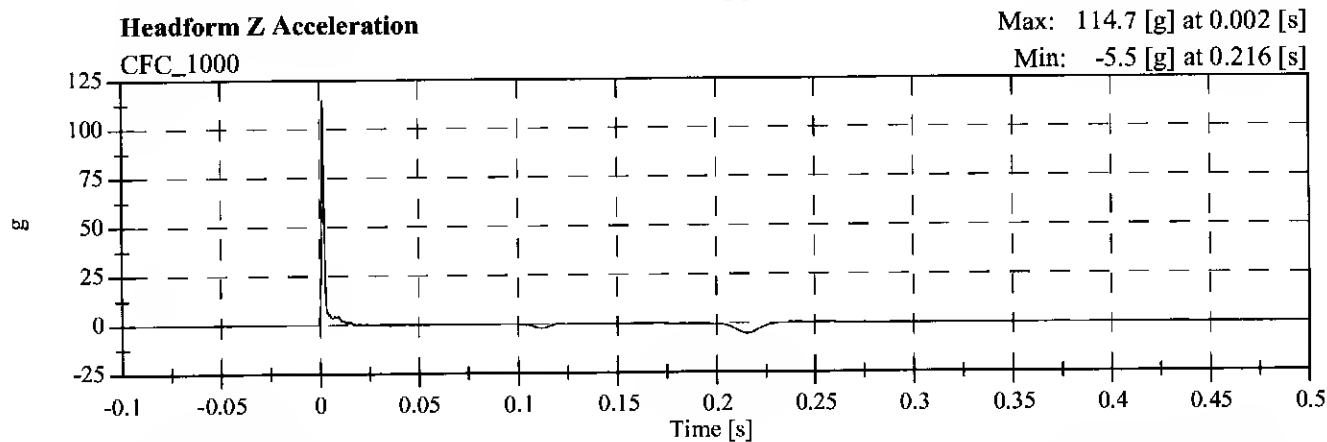
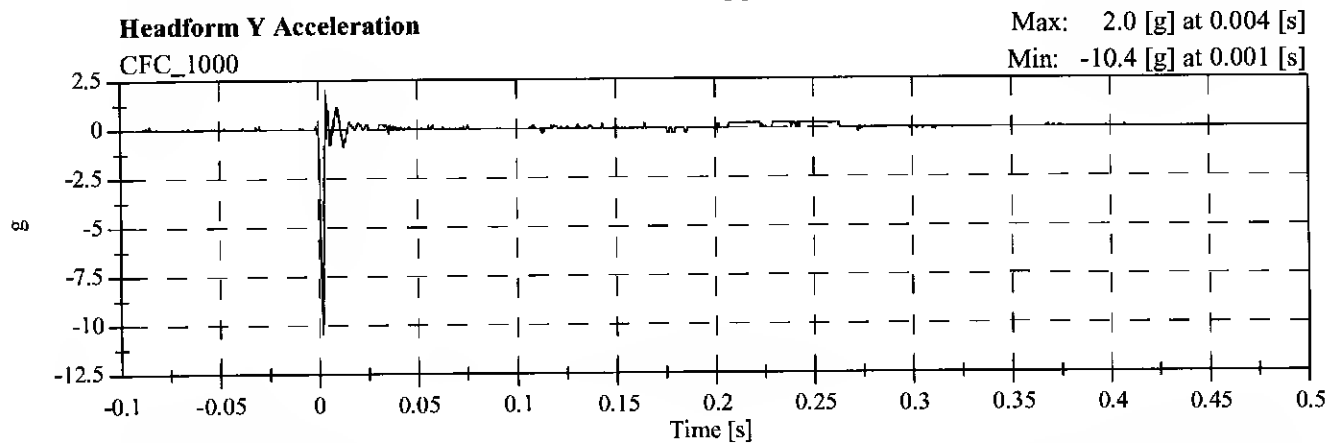
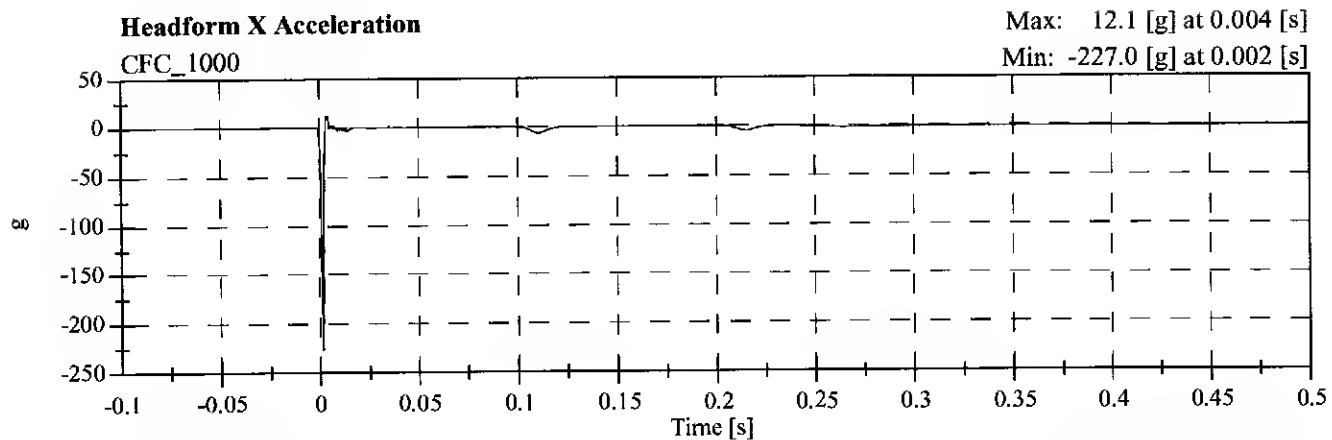
HEAD ACCELEROMETER CALIBRATION INFORMATION

ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J24876	10/06/2004	04/06/2005
2 - LATERAL	ENDEVCO	7264-2000T	J33030	10/06/2004	04/06/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J31009	10/06/2004	04/06/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0642 - March 10, 2005



**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:		DENTON SAFETY SYSTEMS	
SERIAL NUMBER:		0062	
CALIBRATION DATE:		March 10, 2005	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		21.7
RELATIVE HUMIDITY	10% to 70%		32
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		227.7
PEAK LATERAL ACCELERATION	15 Gs Maximum		11.5
IS ACCELERATION CURVE UNIMODAL?	YES		YES

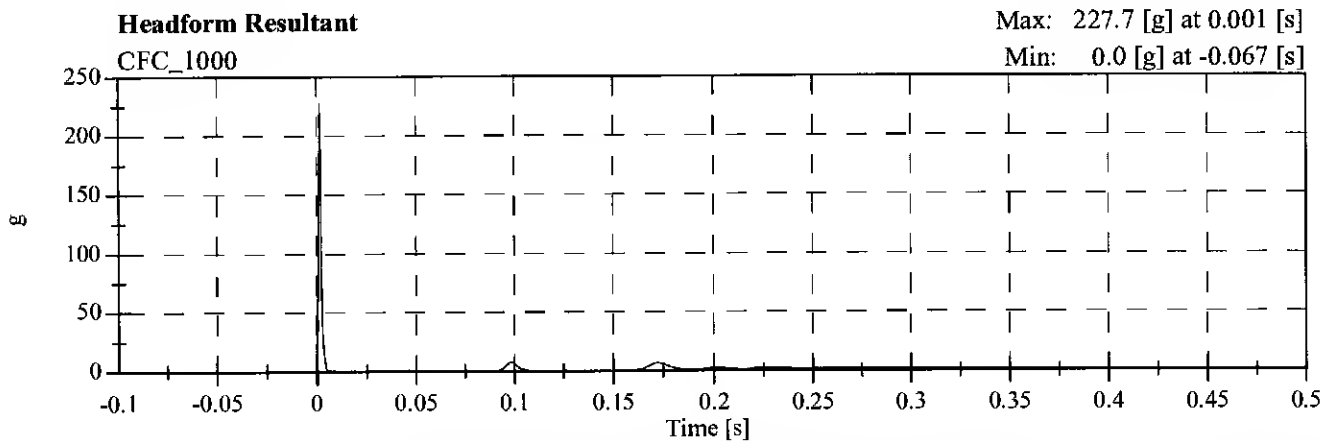
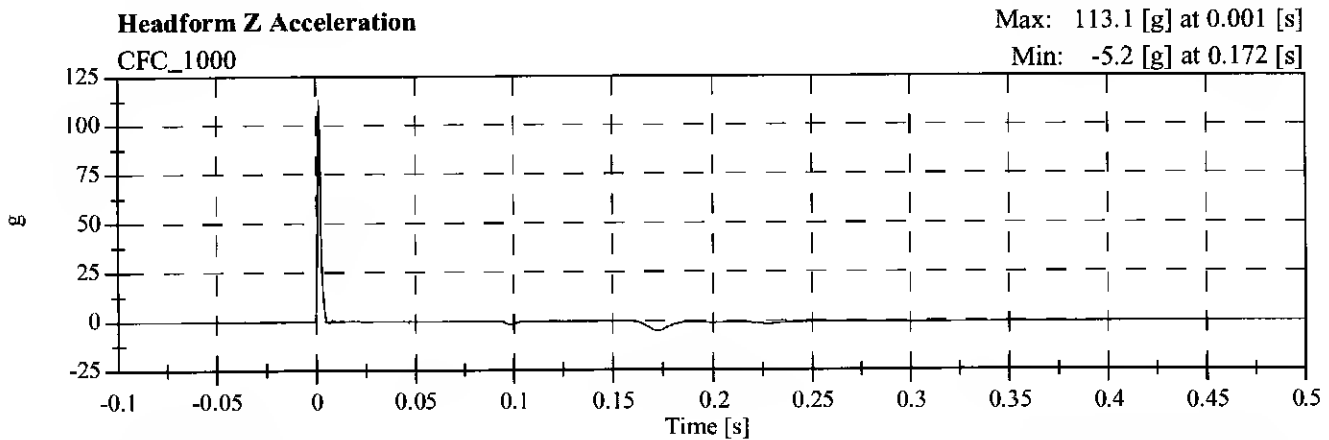
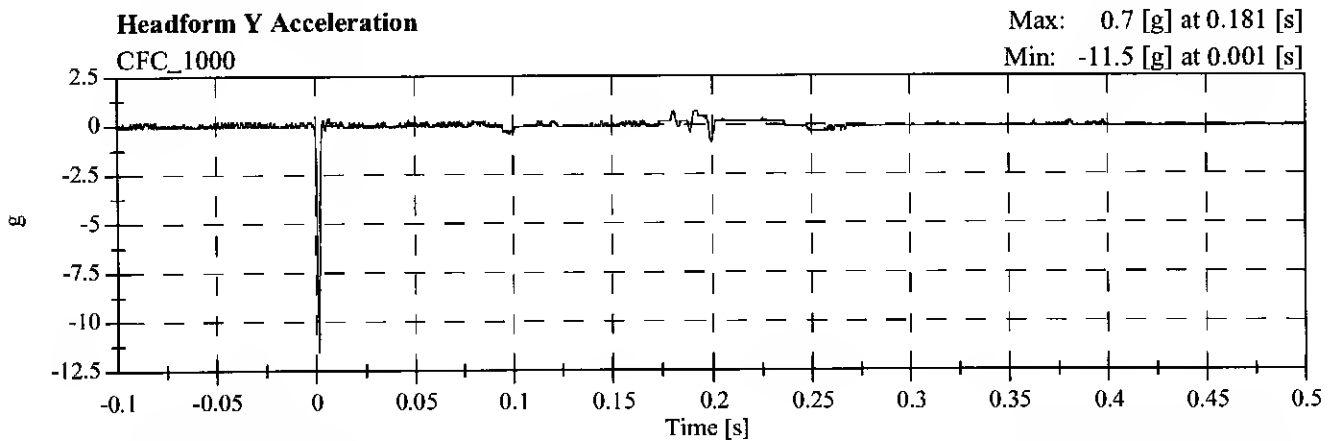
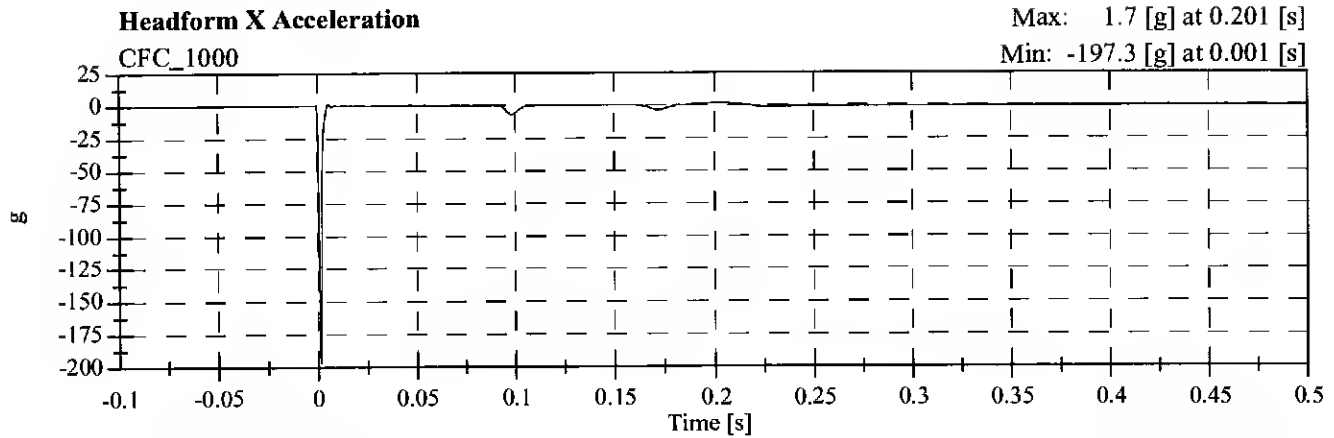
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J33127	10/06/2004	04/06/2005
2 - LATERAL	ENDEVCO	7264-2000T	J33019	10/06/2004	04/06/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J32782	10/06/2004	04/06/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0062 - March 10, 2005



**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:		FIRST TECHNOLOGIES SAFETY SYSTEMS	
SERIAL NUMBER:		805	
CALIBRATION DATE:		March 10, 2005	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		21.7
RELATIVE HUMIDITY	10% to 70%		32
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		230.6
PEAK LATERAL ACCELERATION	15 Gs Maximum		10.2
IS ACCELERATION CURVE UNIMODAL?	YES		YES

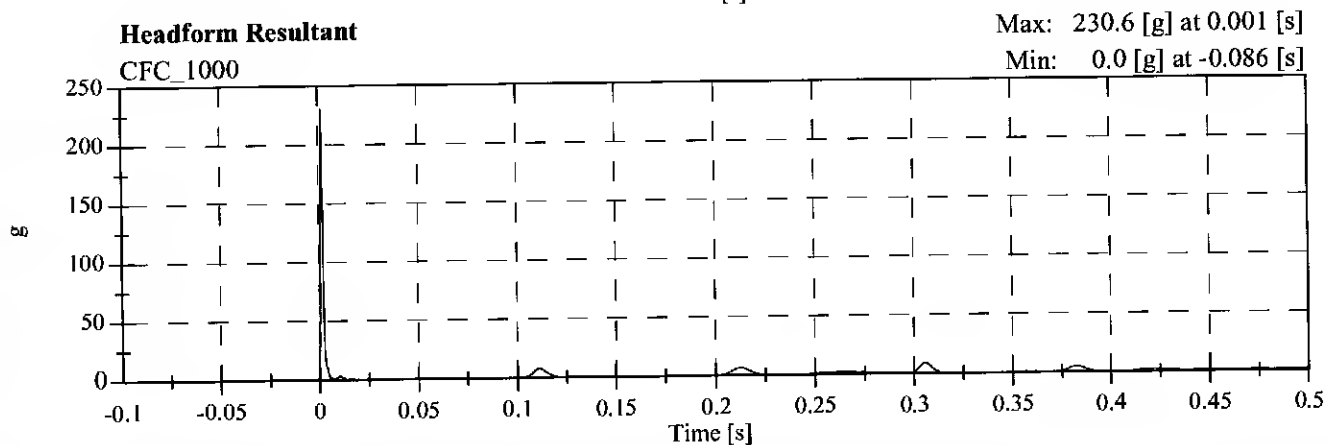
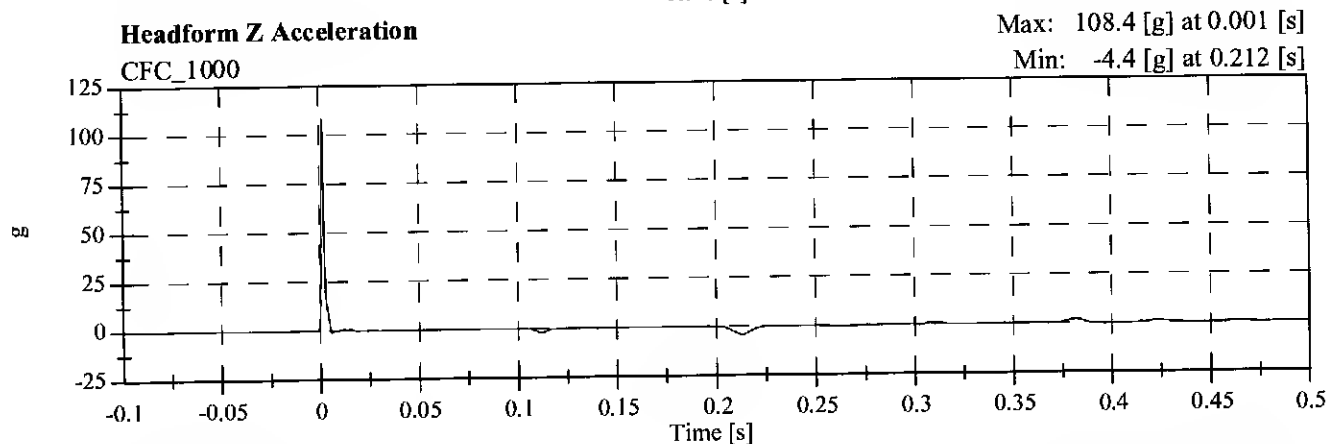
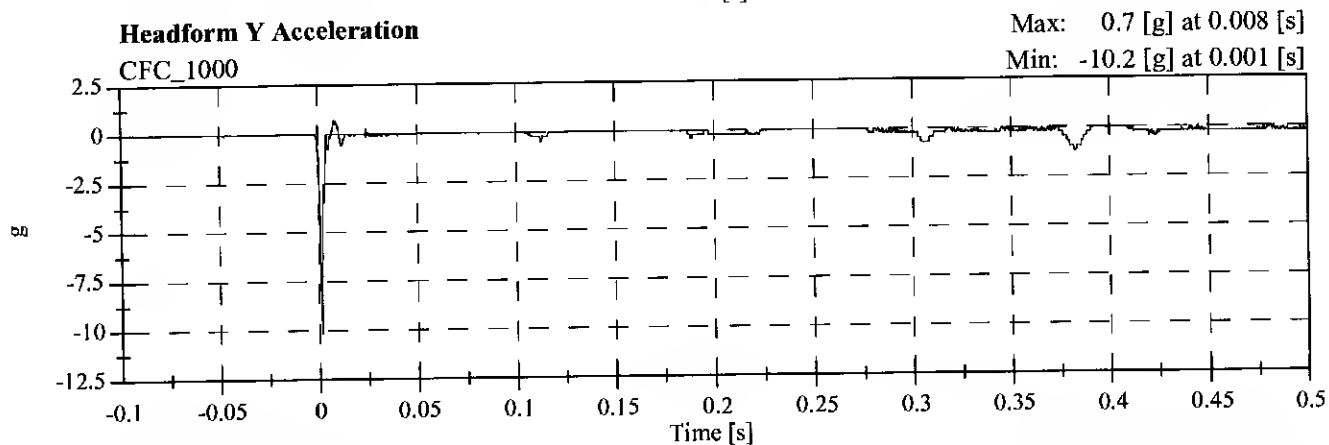
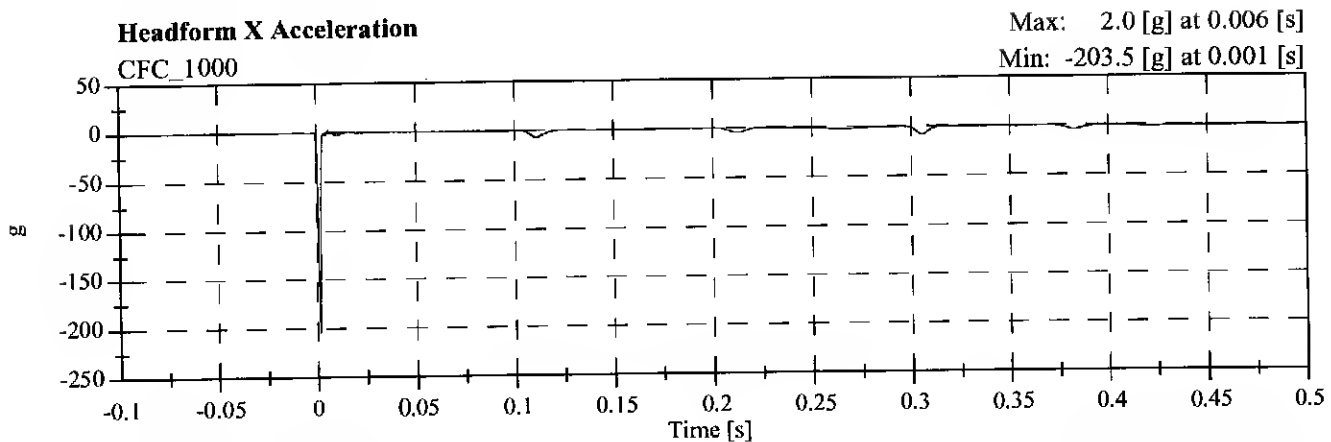
HEAD ACCELEROMETER CALIBRATION INFORMATION

ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J38127	10/06/2004	04/06/2005
2 - LATERAL	ENDEVCO	7264-2000T	J37980	10/06/2004	04/06/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J37854	10/06/2004	04/06/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0805 - March 10, 2005



**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:		DENTON SAFETY SYSTEMS	
SERIAL NUMBER:		0355	
CALIBRATION DATE:		March 10, 2005	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		21.7
RELATIVE HUMIDITY	10% to 70%		32
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		236.5
PEAK LATERAL ACCELERATION	15 Gs Maximum		5.3
IS ACCELERATION CURVE UNIMODAL?	YES		YES

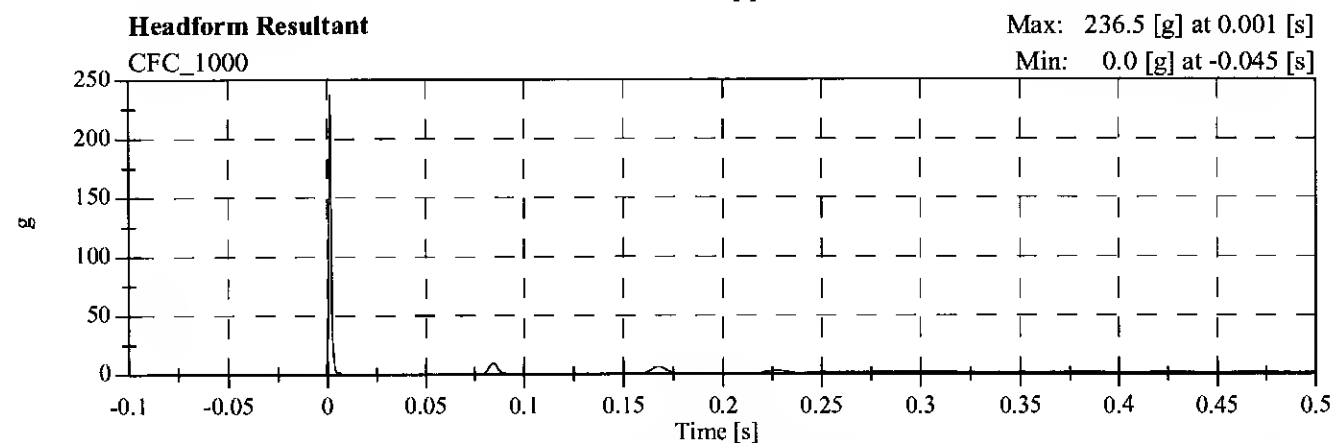
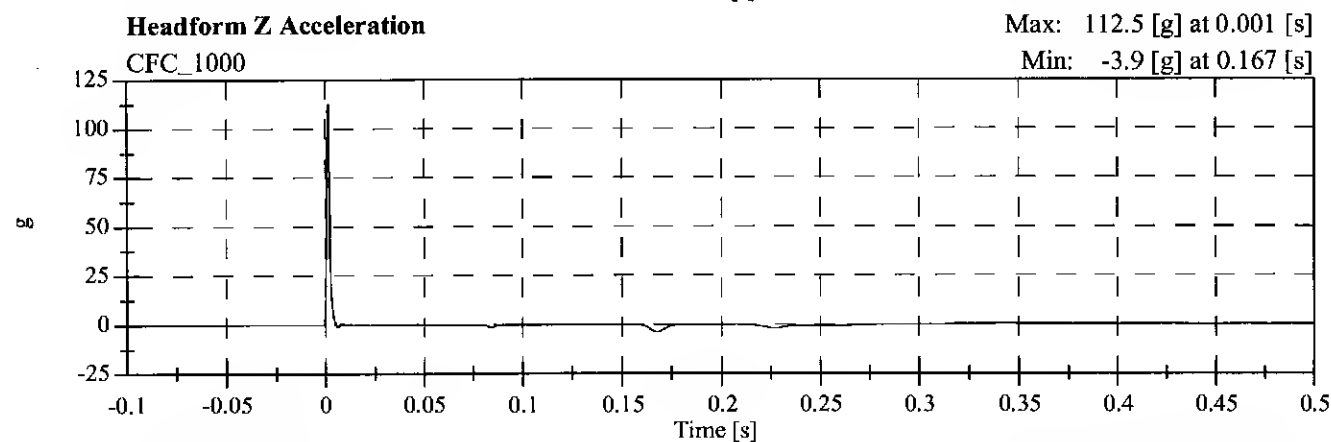
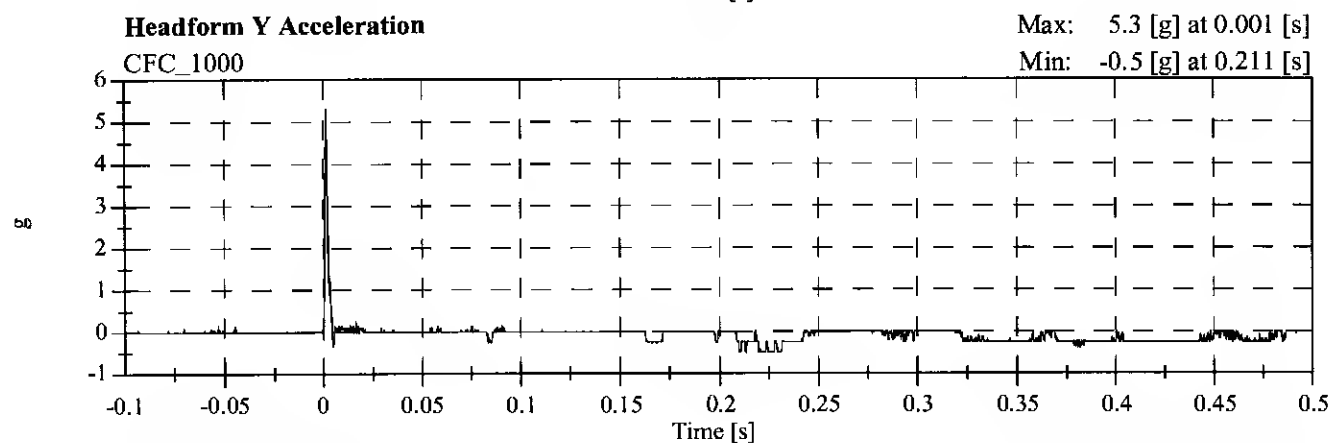
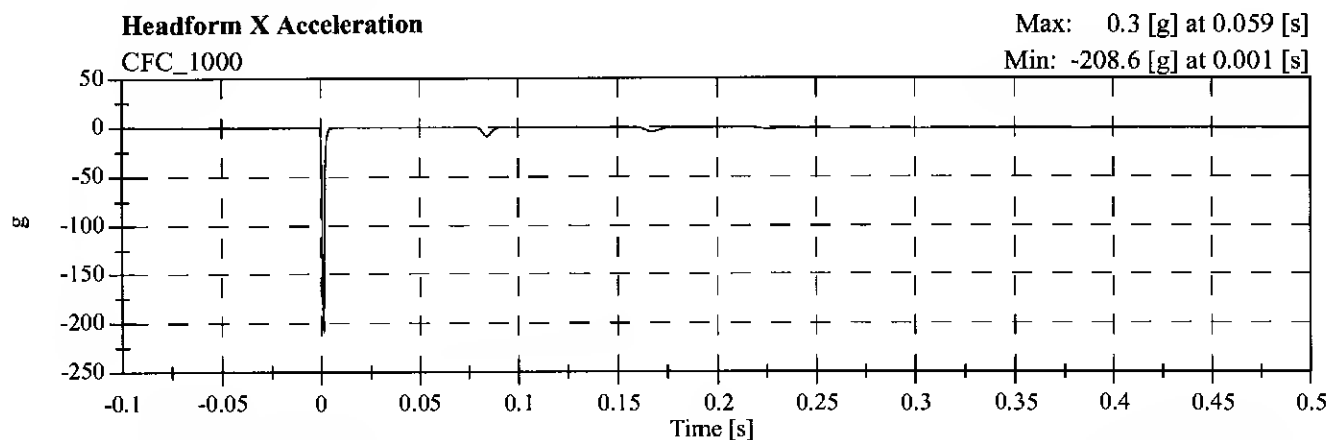
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J28671	10/06/2004	04/06/2005
2 - LATERAL	ENDEVCO	7264-2000T	J32779	10/06/2004	04/06/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J25854	10/06/2004	04/06/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0355 - March 10, 2005



**PART 572L
HEAD DROP PRE-TEST**

MANUFACTURER:		FIRST TECHNOLOGIES SAFETY SYSTEMS	
SERIAL NUMBER:		1255	
CALIBRATION DATE:		March 10, 2005	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		21.7
RELATIVE HUMIDITY	10% to 70%		32
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		257.3
PEAK LATERAL ACCELERATION	15 Gs Maximum		2.7
IS ACCELERATION CURVE UNIMODAL?	YES		YES

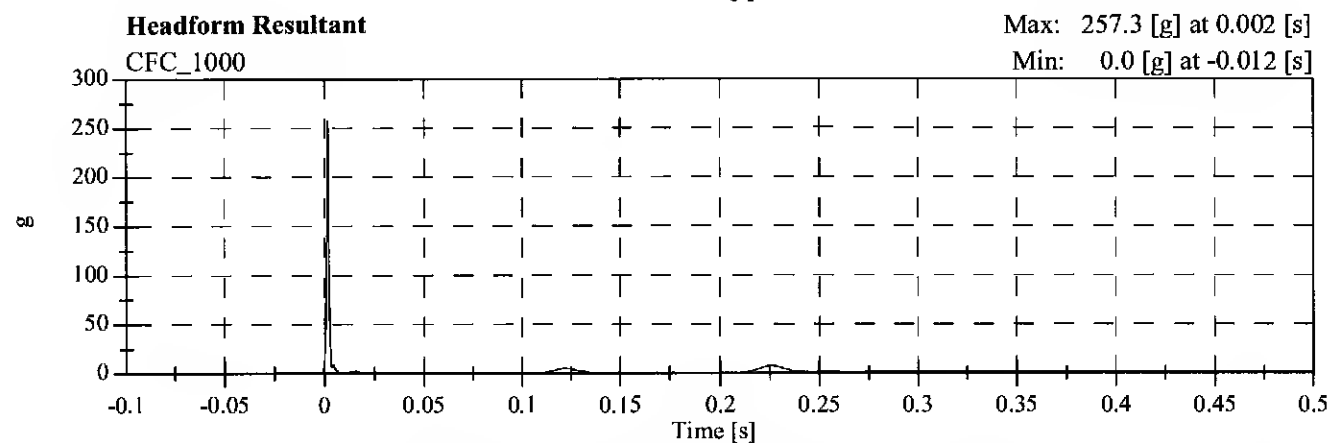
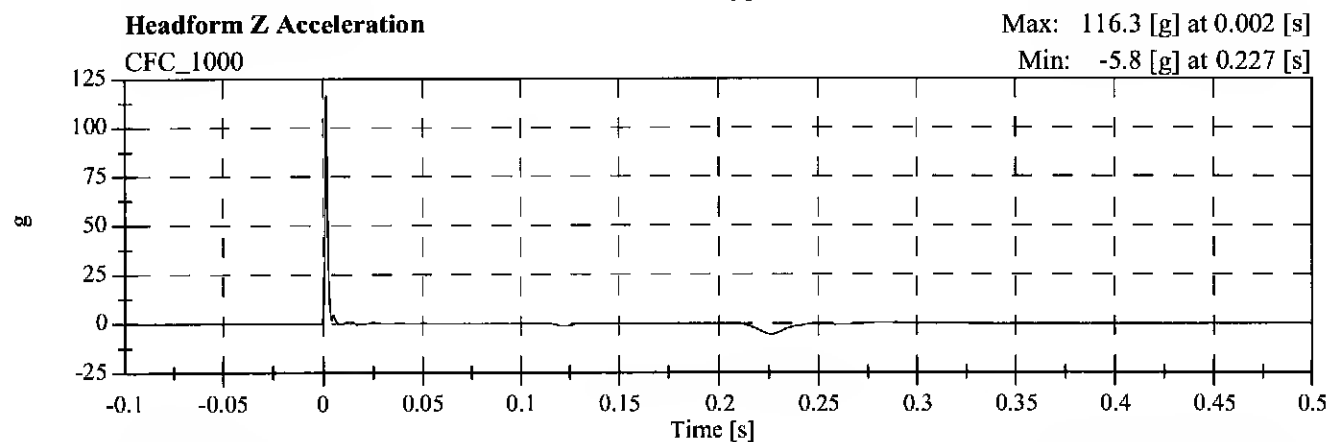
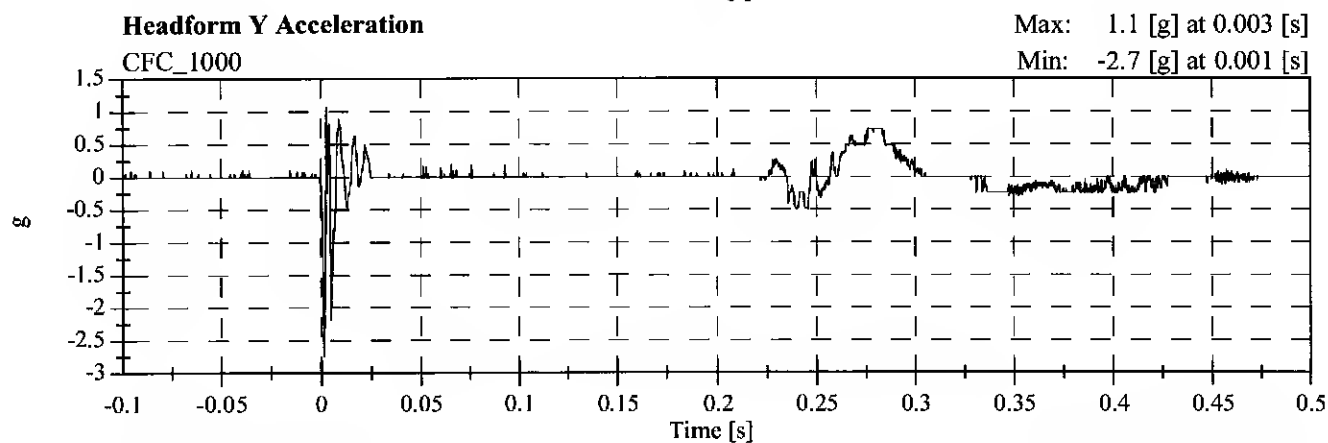
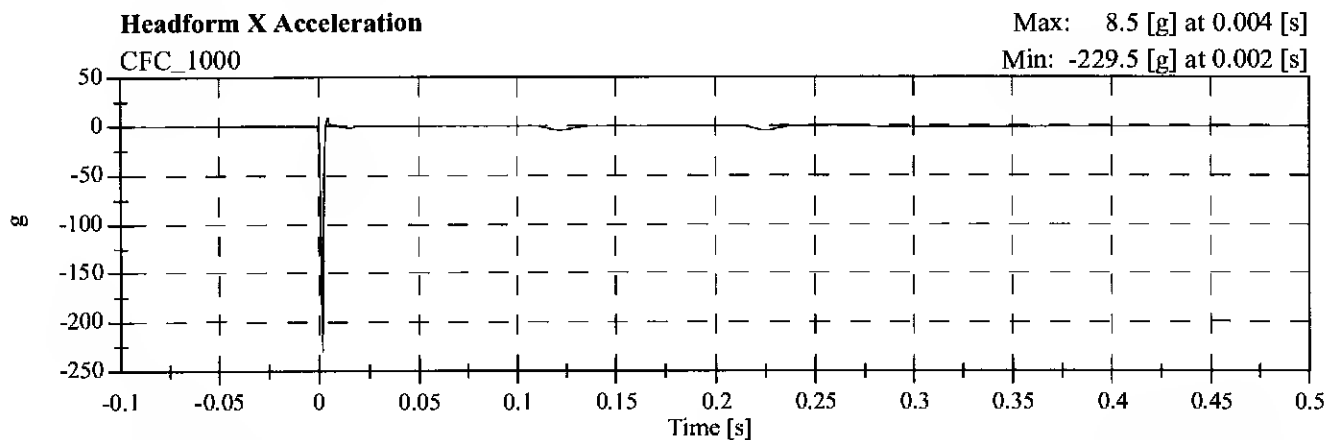
HEAD ACCELEROMETER CALIBRATION INFORMATION

LD. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J41006	10/06/2004	04/06/2005
2 - LATERAL	ENDEVCO	7264-2000T	J40994	10/06/2004	04/06/2005
3 - VERTICAL	ENDEVCO	7264-2000T	J41007	10/06/2004	04/06/2005

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH1255 - March 10, 2005



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		DENTON SAFETY SYSTEMS
SERIAL NUMBER:		0642
CALIBRATION DATE:		March 24, 2005
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	23.9
RELATIVE HUMIDITY	10% to 70%	20
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	248.4
PEAK LATERAL ACCELERATION	15 Gs Maximum	1.3
IS ACCELERATION CURVE UNIMODAL?	YES	YES

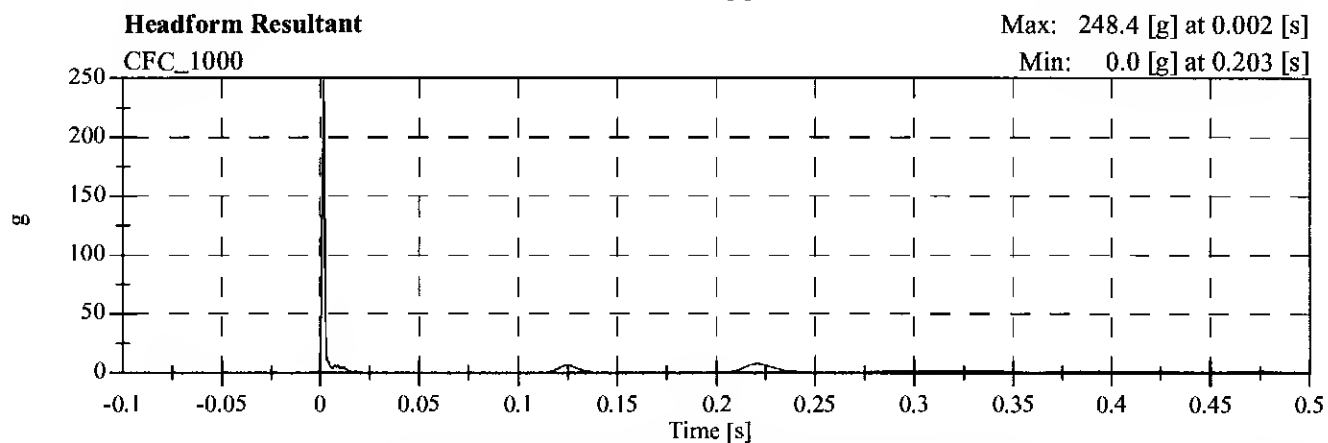
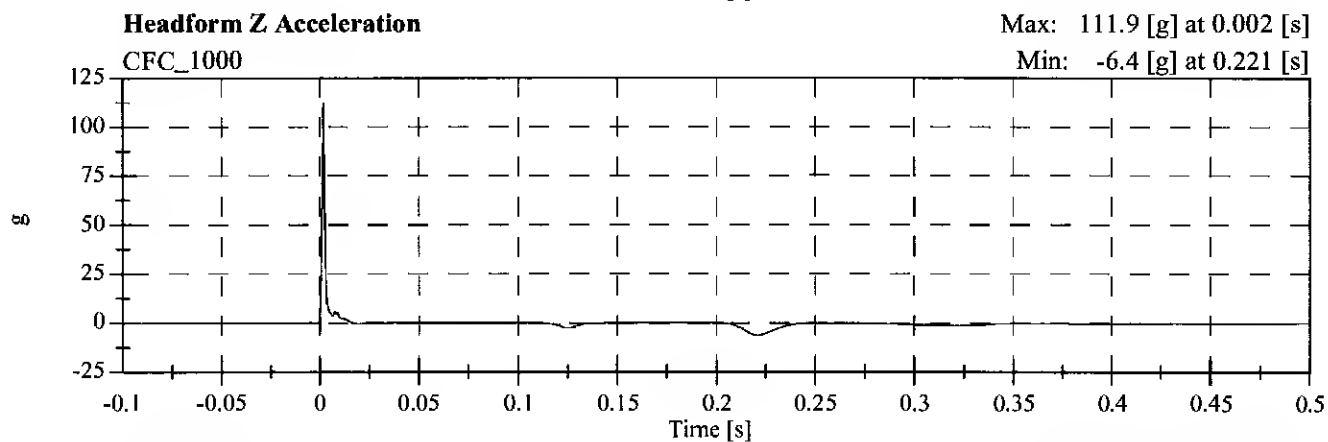
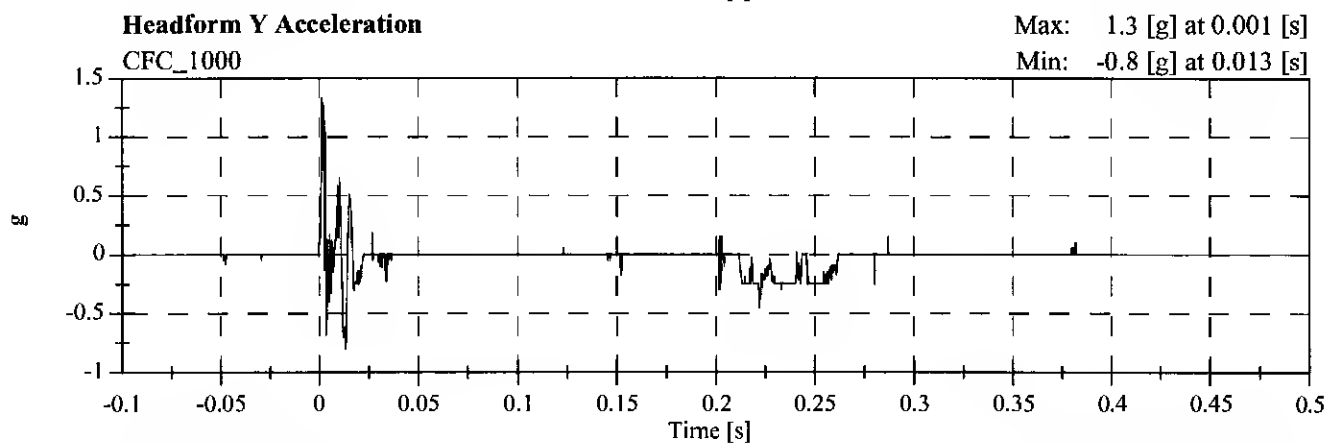
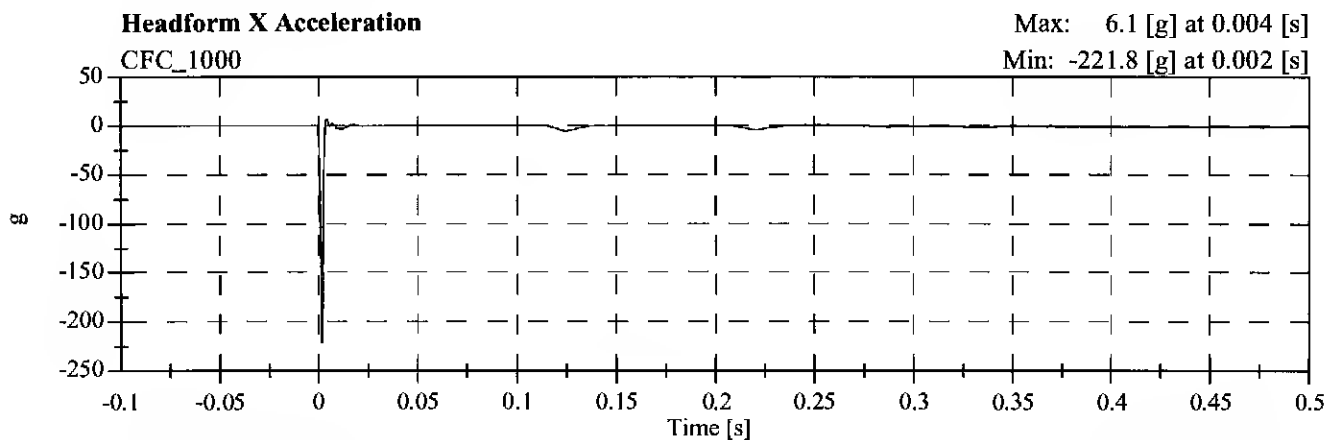
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J24876	03/16/05	09/16/05
2 - LATERAL	ENDEVCO	7264-2000T	J33030	03/16/05	09/16/05
3 - VERTICAL	ENDEVCO	7264-2000T	J31009	03/16/05	09/16/05

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0642 - March 24, 2005



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		FIRST TECHNOLOGIES SAFETY SYSTEMS	
SERIAL NUMBER:		0062	
CALIBRATION DATE:		March 24, 2005	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		23.9
RELATIVE HUMIDITY	10% to 70%		20
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		243.9
PEAK LATERAL ACCELERATION	15 Gs Maximum		5.0
IS ACCELERATION CURVE UNIMODAL?	YES		YES

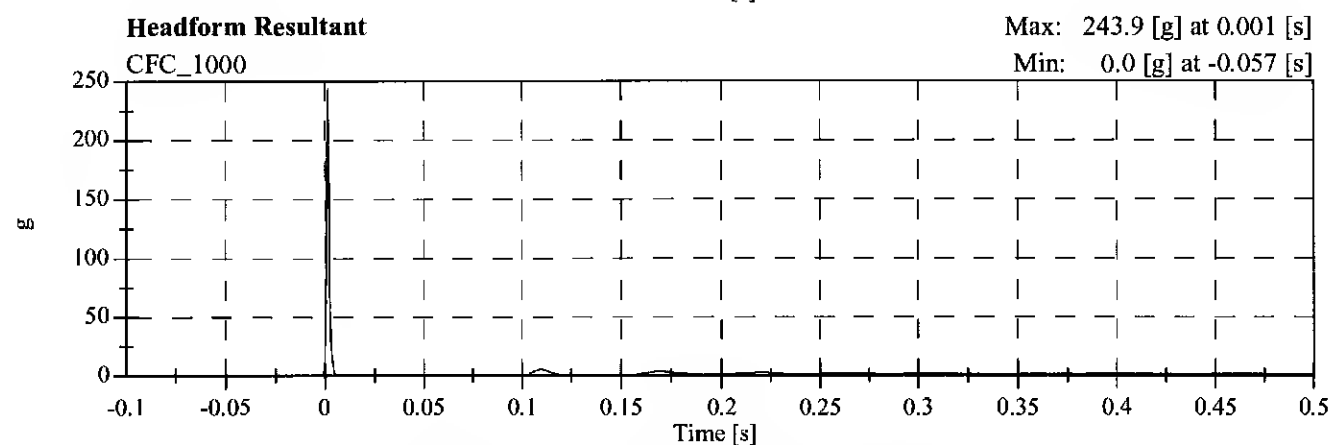
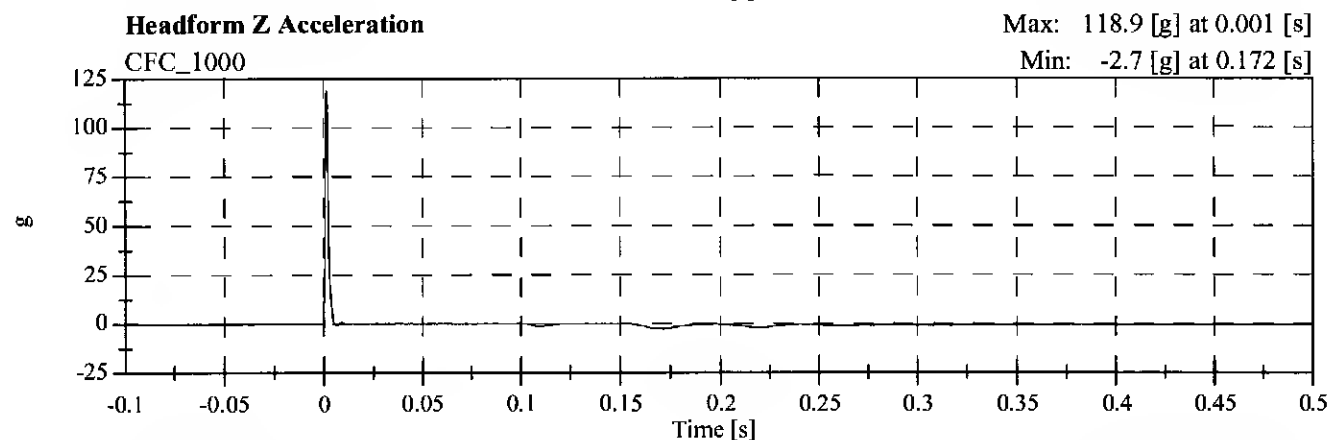
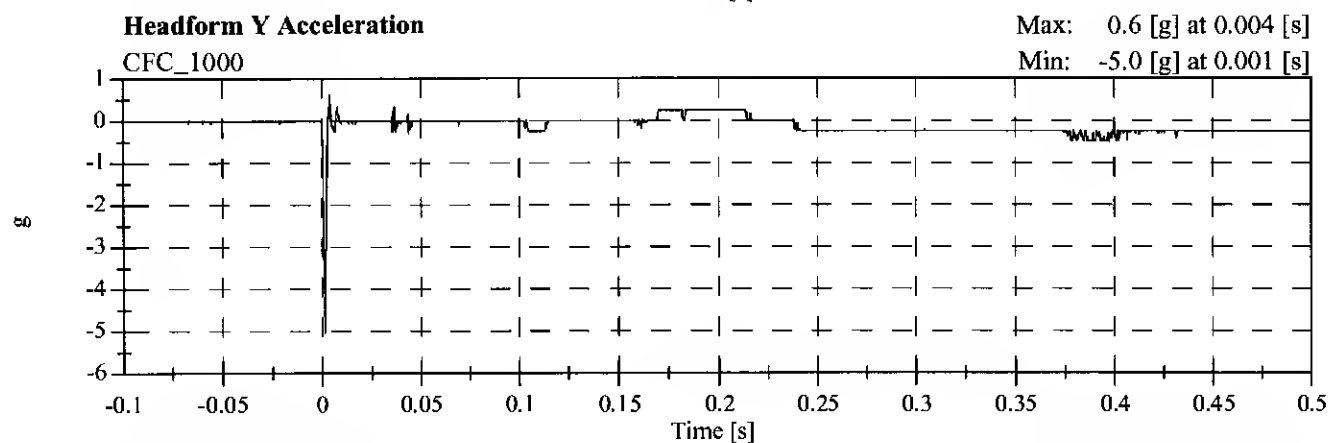
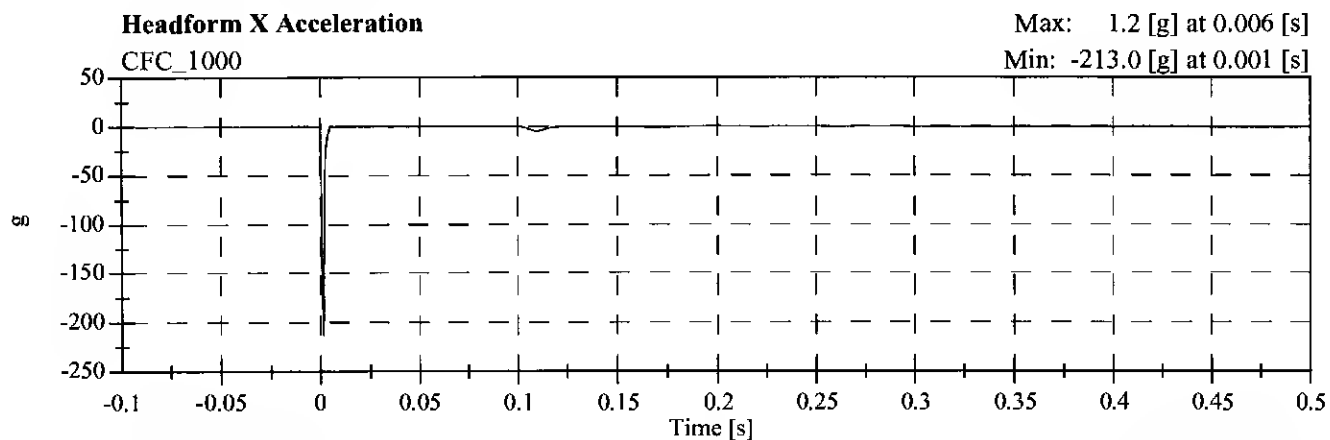
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J33127	03/16/05	09/16/05
2 - LATERAL	ENDEYCO	7264-2000T	J33019	03/16/05	09/16/05
3 - VERTICAL	ENDEVCO	7264-2000T	J32782	03/16/05	09/16/05

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0062 - March 24, 2005



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		FIRST TECHNOLOGIES SAFETY SYSTEMS
SERIAL NUMBER:		805
CALIBRATION DATE:		March 24, 2005
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	19°C to 26°C	23.9
RELATIVE HUMIDITY	10% to 70%	20
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs	251.1
PEAK LATERAL ACCELERATION	15 Gs Maximum	2.7
IS ACCELERATION CURVE UNIMODAL?	YES	YES

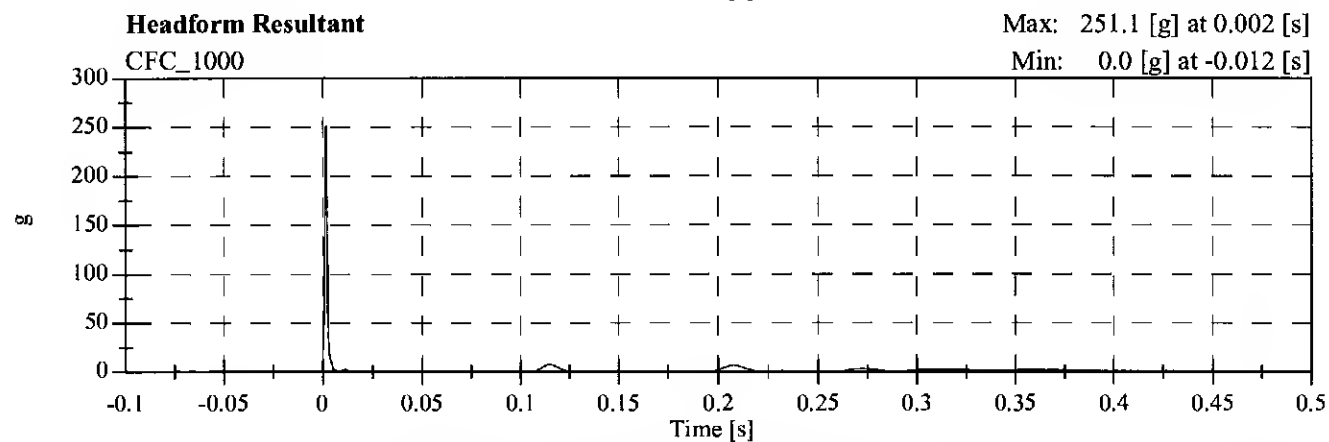
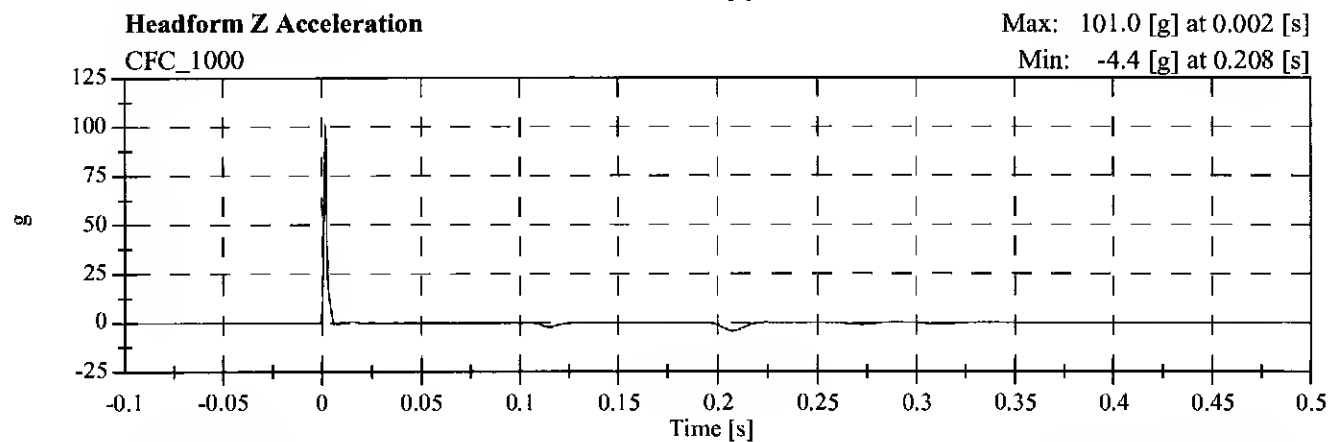
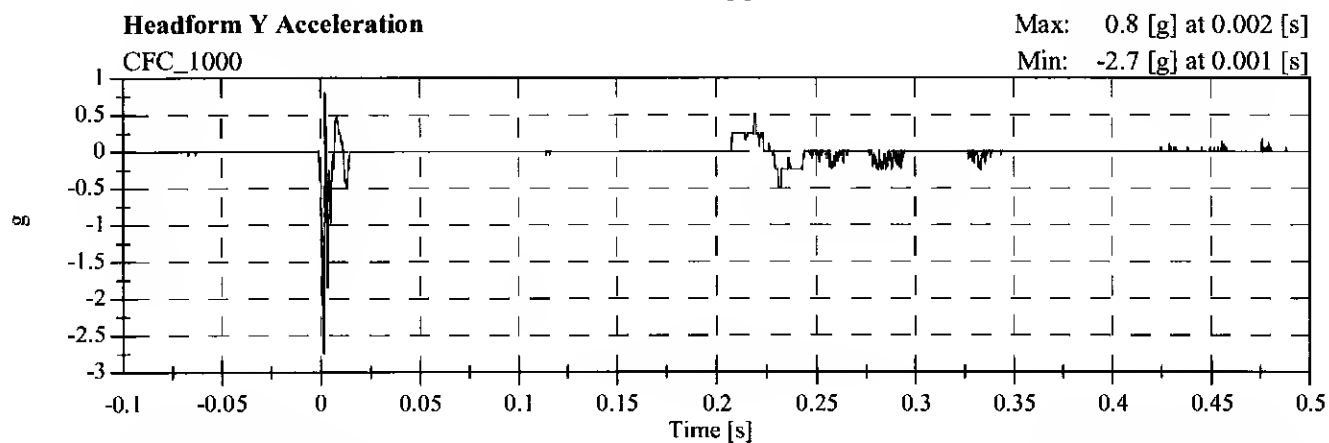
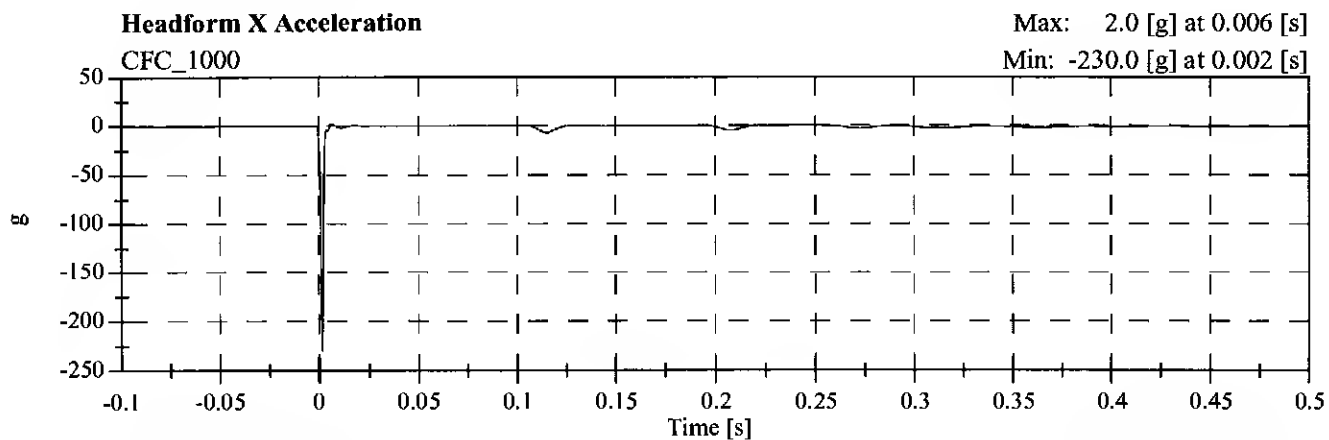
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J38127	03/16/05	09/16/05
2 - LATERAL	ENDEVCO	7264-2000T	J37980	03/16/05	09/16/05
3 - VERTICAL	ENDEVCO	7264-2000T	J37854	03/16/05	09/16/05

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0805 - March 24, 2005



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		DENTON SAFETY SYSTEMS	
SERIAL NUMBER:		0355	
CALIBRATION DATE:		March 24, 2005	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		23.9
RELATIVE HUMIDITY	10% to 70%		20
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		243.8
PEAK LATERAL ACCELERATION	15 Gs Maximum		4.8
IS ACCELERATION CURVE UNIMODAL?	YES		YES

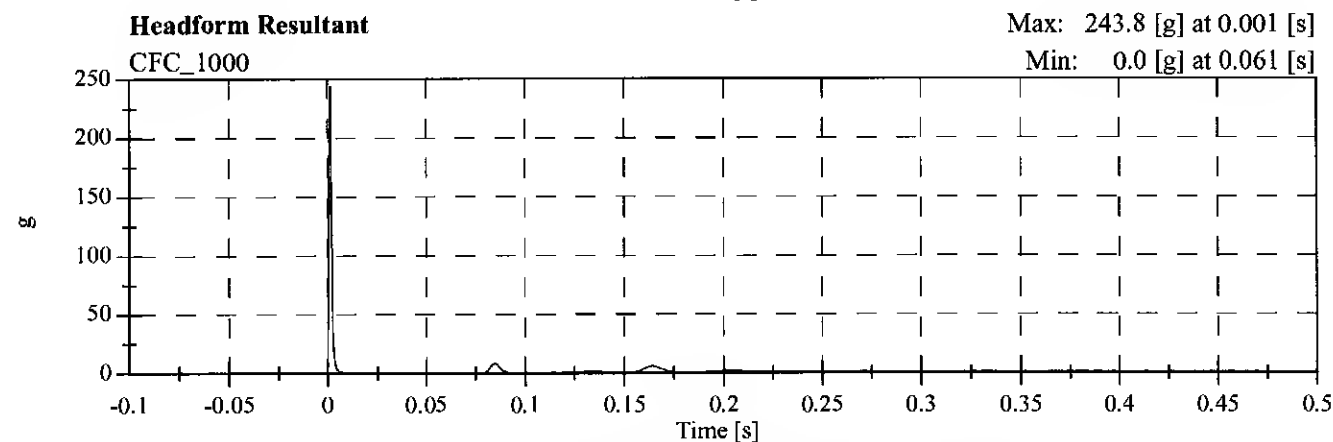
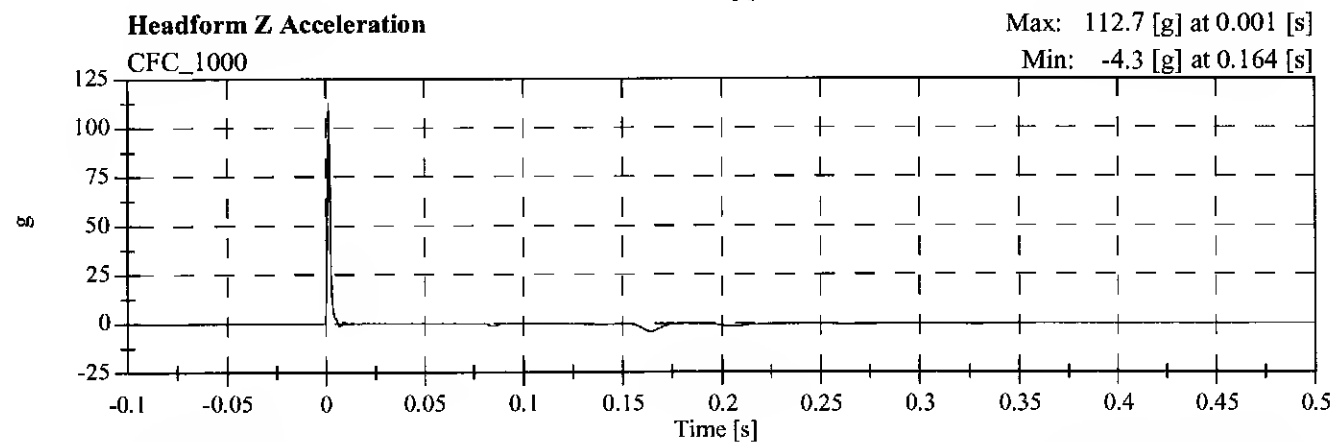
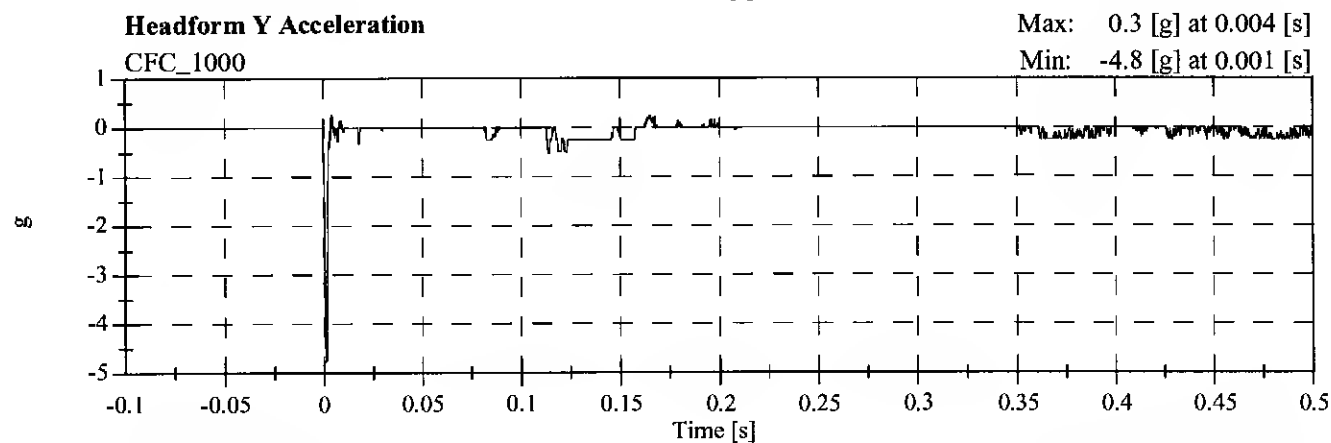
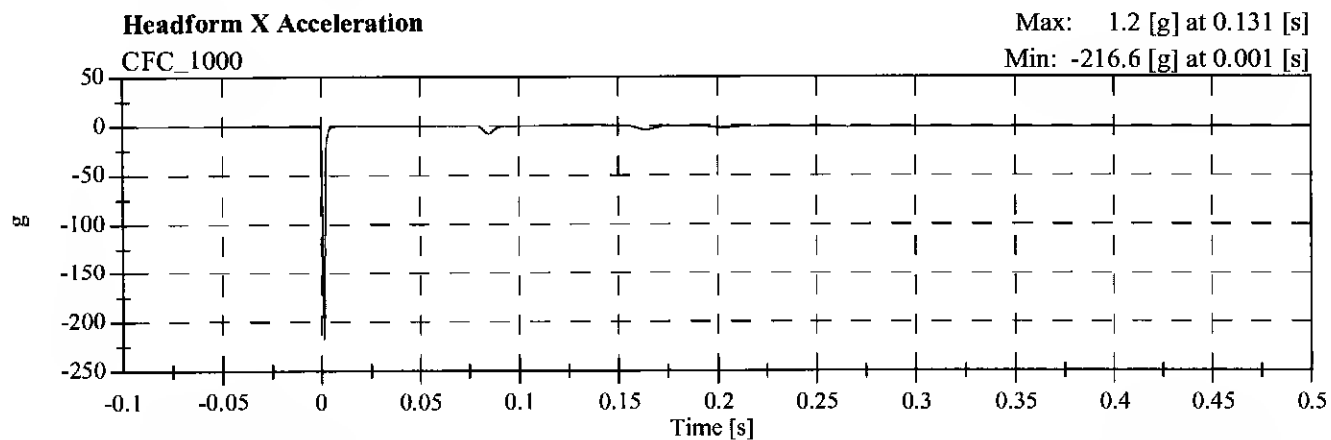
HEAD ACCELEROMETER CALIBRATION INFORMATION

I.D. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J28671	03/16/05	09/16/05
2 - LATERAL	ENDEVCO	7264-2000T	J32779	03/16/05	09/16/05
3 - VERTICAL	ENDEVCO	7264-2000T	J25854	03/16/05	09/16/05

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH0355 - March 24, 2005



**PART 572L
HEAD DROP POST-TEST**

MANUFACTURER:		FIRST TECHNOLOGIES SAFETY SYSTEMS	
SERIAL NUMBER:		1255	
CALIBRATION DATE:		March 24, 2005	
TEST PARAMETER	SPECIFICATION		TEST RESULTS
TEMPERATURE	19°C to 26°C		23.9
RELATIVE HUMIDITY	10% to 70%		20
PEAK RESULTANT ACCELERATION	225 Gs to 275 Gs		270.5
PEAK LATERAL ACCELERATION	15 Gs Maximum		11.2
IS ACCELERATION CURVE UNIMODAL?	YES		YES

HEAD ACCELEROMETER CALIBRATION INFORMATION

ID. NUMBER	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	DATE OF LAST CALIBRATION	DATE OF NEXT CALIBRATION
1 - LONGITUDINAL	ENDEVCO	7264-2000T	J41006	03/16/05	09/16/05
2 - LATERAL	ENDEVCO	7264-2000T	J40994	03/16/05	09/16/05
3 - VERTICAL	ENDEVCO	7264-2000T	J41007	03/16/05	09/16/05

REMARKS:

FMVSS 201U - Headform Calibration Drops

FMH1255 - March 24, 2005

